The Iron Age
FOUNDED 1855

Steel Wage Follies of 1951

THE stage is set for the sixth edition of that lusty, roisterous and wholly one-sided show "Steel Wage Follies." Nothing has been left out this year. The scenery and props will be most bizarre.

Advance press agents have been heralding the big show. Slowdowns, work stoppages (i.e. strikes) and general restlessness have been billed as pre-negotiation "softening up."

Not to be outdone by the Murray actors, minor steel players have written their warnings. To the manipulators behind the scenes they have spelled out—no price increase, no wage increase.

Philip Murray, chief producer and character in this yearly extravaganza, has the support of the invisible cast of White House & Co. That team is well trained in a political school whose motto is "promised votes must be repaid before delivery."

The gala opening of the big show will come some time next month. Before the curtain goes up the audience will be scared half out of its rubber dollars. The minor cast of steel actors will never get the spotlight.

The steel players have their costs, their backers (stockholders) but no influence with the show's angel. They have lost out so many times when they tried to change the script to a more reasonable plot that they now know the pages are stacked against them. No one believes these pages are stacked against inflation.

Murray & Co. are assured of a good press. They know their angel, the public—through White House & Co.—will eventually pay for the show. Some critics will try to show that all this has happened before and that it doesn't make it any less a phony play.

When it is crystal clear that the steel actors never had a chance the curtain will fall. Then wages will be raised for Murray & Co. The steel industry will be "allowed" to increase prices but not enough to take care of the full increase in wages and materials. A similar show will be repeated on other circuits.

Tom Campbell

Editor

PENNSALT AE-18 — the original non-scaling aluminum etchant — gives you more productive manhours

Why waste precious manhours chipping hard, rock-like scale out of your aluminum etching tanks? Pennsalt AE-18—the original non-scaling etchant—lets you clean those tanks with just a stream of water, *in minutes instead of hours!*

Here are some typical savings for users of Pennsalt AE-18:

***Manufacturer of aluminum forgings*—cut tank cleaning time from 48 manhours to about 3, eliminated air-hammer chipping. A real dollar saving!**

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All users praise the satin-like quality of an AE-18 etch. Solution control is easier, more accurate—giving you a uniform surface. Most scratch and die marks come out of the metal with AE-18.

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Dear Editor:

Letters from readers

ew Format

r:

I would like to take this opportunity compliment you and your associ- es on the new geography of THE ON AGE. I always found your agazine worth reading and now it a lot easier to do so.

I. LIPKOWITZ
Assistant to President

eynolds Metals Co.
ew York

ong Live The King

ir:

I agree with the scrap title "Long ive The King" (editorial, Sept. 20). hat about a rate on scrap from the est to the large consuming centers. here must be a lot of it in that area.

D. B. GILLIES
Mining Consultant

epublic Steel Corp.
leveland

arbonitriding

ir:

May we have permission to repro- uce the article "Carbonitriding on the ncrease" which appeared in your ept. 13 issue, p. 151. The contents ill not be changed.

We feel sure that our representa- ives will enjoy reading this article as uch as we, in the New York office, id.

C. A. JENSEN

he Barrett Div.
llied Chemical & Dye Corp.
ew York

crap Drive

ir:

I have read with a great deal of nterest the article on p. 120 of your ept. 28 issue . . .

I have a plan in mind and THE IRON AGE is the logical organization to get t going . . . The Boy Scouts are in a osition to locate and gather scrap n the cities and the Four H Clubs are n a position to locate and gather crap in the country and small towns nd villages . . . These youngsters an comb the fence corners and the lleys and pick up many tons of scrap n small amounts . . .

F. J. MANKOFF
President

he W-W Grinder Corp.
Wichita, Kan.

A good idea, but perhaps the time is not ripe for a household scrap drive.—Ed.

Boron Steels

Sir:

We noticed an interesting article in your June 21 issue, p. 107, on boron steels. We would like to get more information on this and would appreciate your letting us know whom we might contact to see if this steel is now available for general distribution.

L. C. RAYMOND
Purchasing Agent

Beatty Bros. Ltd.
Fergus, Ont.

We have published a 5-part article on the latest available information on boron steels starting with our July 5 issue. The series has been reprinted in booklet form. The major tonnages are being produced by Bethlehem Steel Co., Republic Steel Corp., Wisconsin Steel Div. of International Harvester Co. and U. S. Steel Co.—Ed.

For The Records

Sir:

I would like to call your attention to an error made in your Oct. 4 issue. Our company was included in a list of exhibitors to be at the Metal Show and the word "furnaces" was connected with it.

We are concerned about this matter because we realize that thousands of people will read your magazine, which is recognized as the leader among the publications dealing with the metalworking industries, and we want the metalworking people to know us as a manufacturer of low temperature freezers.

C. M. SHELBURN
Vice President

Webber Appliance Co., Inc.
Indianapolis

Ingot Capacity

Sir:

We have been doing some work on steel ingot capacity by company and by region. One of my associates thinks he may have seen a map in a past issue of THE IRON AGE showing locations of United States plants and the ingot capacity of each. In case we are correct, could you please send us a copy as it would be most helpful.

J. E. EATON

Eaton & Howard
Boston

An ingot capacity chart by districts was published in our Oct. 11 issue, p. 60.—Ed.

Iron Ore Outlook

Sir:

We have read the article "Iron Ore: Future Supply Looks Bright" in your Sept. 27 issue. We would like to obtain one dozen copies of this report.

A. GUIBET
President

McWilliams Dredging Co.
New Orleans

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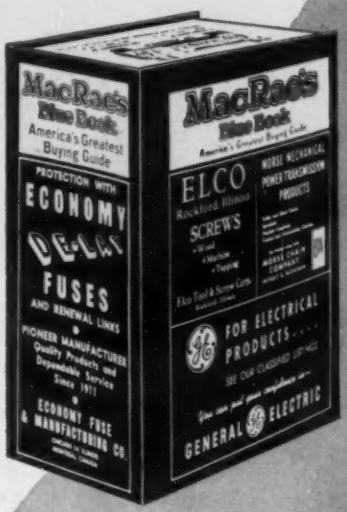
59th edition being compiled. A space order now will assure a choice position.



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Fatigue Cracks

By Charles T. Post

While Mr. Post stops to catch his breath, Fatigue Cracks this week has a guest columnist. The breathless prose you see below is that of Paul de Guzman, New York advertising man.—The Editors.

Do You Beat Your Wife?

Like all editors, we read a lot and swipe a lot. Somewhere recently we read about a new series of psychometric tests for people who are hired by the government for super-secret work. As you might expect, they ask a million tricky questions . . . but none more interesting than this: "*When you are mad and beat your wife, do you:*

a. Put your hands around her throat and choke her?
b. Just sock her over the head with the nearest weapon handy?
c. Beat her over the head with a baseball bat?"

First man who answers is out at home plate.

Whispering

Did you ever take a guest on a trip through the plant and be pretty sure he never heard a word you said? Or, worse yet, were you ever the guest, trying to hear your host talk over the bang of a punch press, and all you could do was nod and try to look intelligent? In either embarrassing situation, this story may cheer you:

Do you know about the fellow who had the uncontrollable alarm clock that every morning around 3 o'clock would ring for no good reason at all?

But bye and bye he got used to it, and it never bothered him. . . .

And then one morning it didn't go off at 3 o'clock. . . .

So he jumped out of bed with a start and said, "What was that?"

Aptronyms

This is a regular feature. In this guest editor's life it has been an off and on feature. Once we worked in an advertising agency where the receptionist made a written note of such business. Never paid much attention to her until the day she came in and said, "There's a Mr. Horsefall from Polo Magazine to see you." Honest!

Of course, if you want to walk up Madison Ave. into the Eighties, there honestly is a C. A. Powders who runs a drug store . . . and there honestly is a Michael Finneran with a bar on Third Ave. . . . an undertaker named Nicholas Apostle . . . and a detective agency named John Shields.

Machine Tools

For the education of the layman, the DPA-NPA Office of Public Information has prepared a short treatise entitled, "Facts About Machine Tool Production."

To start off, it gives this definition of a machine tool: "A machine tool is a device to cut metal."

Beulah, please pass the tin snips!

Keep To The Point

And then there was the magnate who cautioned the public relations department, "Please don't put such long words in my speeches. I want to know what I'm talking about."

Puzzlers

We only have room for the puzzle this week. It's a variation of an old favorite with a new twist. Watch it!

An old hermit, moving from one shack to another, was carrying a bag of corn and a canary in a cage. He was accompanied by a dog and a cat and he was leading a goose by a string tied around its neck.

Midway he came to a stream. It could be crossed only by means of a small canoe capable of holding only him and two of the five things he was bringing. This posed a problem:

If he left the dog and the cat together, they would stage a fight; if he left the corn and the goose together, the goose would eat the corn; if he left the cat and the canary together, the cat would eat the bird. But he got over successfully and reached a second stream. Here also was a canoe but so small that it would hold him and only one of the five things.

How did he arrange to get them all across both streams without mishap?

On any metal finishing problem

DEPEND on DU-LITE TO CUT COSTS

Courtesy Artistic Wire Products Co.

Graphitic compound, grease and oil made these wire dish strainers tough to prepare for plating. Upon using Du-Lite's #31 Cleaner, the strainers were thoroughly cleaned, and surfaces prepared for plating, with a saving of 1000 lbs. of cleaning compound per month.

What's YOUR problem?

Du-Lite's service to industry is complete from research on specific metal finishing problems to installation of processing equipment. Du-Lite's line includes cleaners, strippers, blacking agents, wetting agents, passivating agents, rust preventatives, burnishing compounds etc. for any type of metal.

See your nearest Du-Lite Field Engineer or write for more information.

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Company.....
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LANDIS THREADS AGAIN HELP AMERICA REARM
Threads produced by the various types of Landis Threading Equipment are again important in the operation of war matériel. Hundreds of Threading Machines, thousands of Die Heads and Taps, hundreds of thousands of sets of Landis Chasers were supplied to manufacturers of war matériel during World War II. It was once estimated that enough Landis Taps were in use to thread 20,000,000 shells a month.
Illustrated on the left are three important wartime adaptations — but all Landis Threading Equipment can do an outstanding defense production job. Necessary adaptations, either in equipment or process, are developed by our Engineering Department from the wealth of experience gained during World War II. Write for further information.
LANDIS Machine COMPANY
WAYNESBORO, PENNSYLVANIA, U. S. A.

Conventions & Meetings

Oct. 25-26—Gray Iron Founders' Society, annual meeting, Edgewater Beach Hotel, Chicago. Society headquarters are at 210 National City—E. 6th Bldg., Cleveland.

Oct. 28-30—Conveyor Equipment Manufacturers Assn., annual meeting, The Homestead, Hot Springs, Va. Association headquarters are at 1129 Vermont Ave., N.W., Washington.

Oct. 29-31—American Gear Manufacturers Assn., semi-annual meeting, Edgewater Beach Hotel, Chicago. Association headquarters are in the Empire Bldg., Pittsburgh.

Oct. 29-Nov. 1—Society of Automotive Engineers, Diesel Engine, Transportation, Fuels & Lubricants Divs. Hotels Drake and Knickerbocker, Chicago. Society headquarters are at 29 W. 39th St., New York.

Oct. 29-Nov. 4—American Institute of Mining & Metallurgical Engineers, fall meeting. Registration at Hotel Del Prado, Mexico City. Institute headquarters are at 29 W. 39th St., New York.

Oct. 31-Nov. 1—Electric Tool Institute, meeting, Skytop Lodge, Skytop, Pa. Institute headquarters are at 1108 Clark Bldg., Pittsburgh.

Oct. 31-Nov. 2 — Foundry Equipment Manufacturers Assn., annual meeting, The Homestead, Hot Springs, Va. Association headquarters are in the Engineers Bldg., Cleveland.

Nov. 1-2—Industrial Management Society, annual time and motion study and management clinic, Sheraton Hotel, Chicago. Society headquarters are at 35 E. Wacker Drive, Chicago.

Nov. 1-2—Society for Advancement of Management, annual conference, Hotel Statler, New York. Society headquarters are at 84 William St., New York.

Nov. 1-4—National Tool & Die Manufacturers Assn., convention, Statler Hotel, St. Louis. Association headquarters are at 1800 Union Commerce Bldg., Cleveland.

Nov. 12-15—National Electrical Manufacturers Assn., annual meeting, Haddon Hall, Atlantic City, N. J. Association headquarters are at 155 E. 44th St., New York.

Nov. 14-15—Industrial Hygiene Foundation, annual meeting and conference, Mellon Institute, Pittsburgh. Foundation headquarters are at 4400 Fifth Ave., Pittsburgh.

Nov. 14-16—National Metal Trades Assn., annual convention, Blackstone Hotel, Chicago. Association headquarters are at 122 S. Michigan Ave., Chicago.

Nov. 15-16—American Zinc Institute, Inc., fall meeting, Galvanizers Committee, St. Francis Hotel, Canton, Ohio. Institute headquarters are at 60 E. 42nd St., New York.

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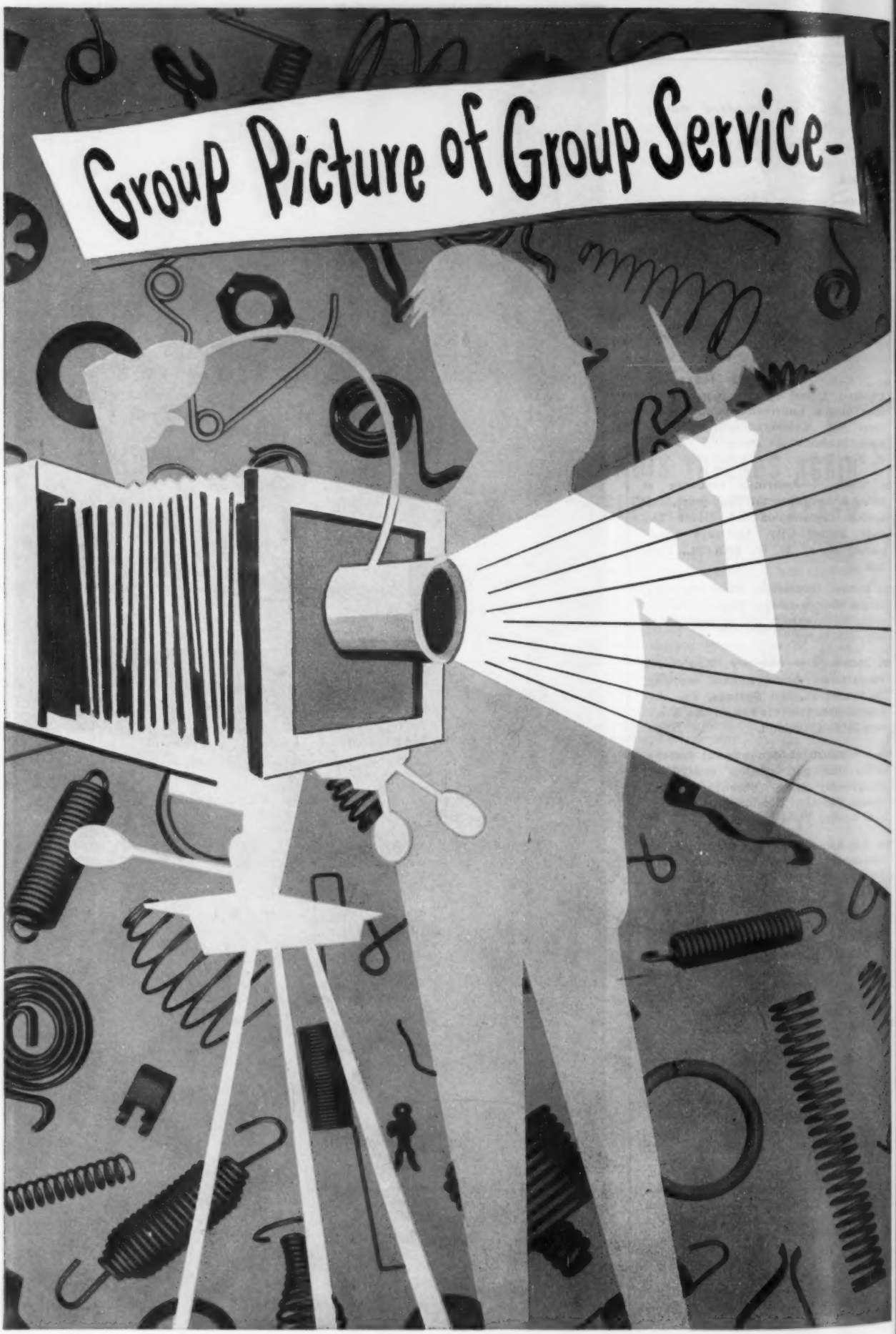
Group Picture of Group Service-

The Iron Age
FOUNDED 1855

THE IRON AGE Newsfront

► Testing specifications on 75 ST aluminum for aircraft applications have been tightened. Much of the original troubles were with porosity in castings. Lately the quality of these castings has improved.

► Navy's approval of low hydrogen welding rods instead of 18-8 rods has helped alloy conservation. There is room for improvement, however; Army is still using modified 18-8 rod on welded tank hulls.

► AEC would like to see more interest in industrial applications of zirconium. Trouble is AEC has been reluctant to divulge to the general public their own experiences with this metal.

► A small quantity of ductile vanadium tubing has been made and is now under test.

► Scrap titanium is being used experimentally instead of ferrotitanium to make 321 type stainless. The metal scrap contains 99.5 pct Ti and yields on furnace additions have been good.

► Plate shortages are the cause of decreased production of large diameter welded line pipe.

► A small lot of 304 stainless liners will be used in rockets employing a fuming acid fuel. It is believed ordinary steels, glass coated, can replace the stainless liners on large production lots of this type of rocket.

► A lithium atmosphere furnace will be used to heat slugs for the hot extrusion of 105 mm shells. The scale-free slugs will be backward extruded and then finished in two cold finishing passes.

► An auto firm found itself stymied because boring mills large enough to use on tank hulls were not available. By rebuilding more readily available 12-ft mills to give a swing clearance of 24 ft, the first machine was delivered in 6 months instead of 24 months. Cost was also reduced 50 pct.

► A pound of aluminum substituted for a pound of steel or cast iron will reduce the weight of automobile parts approximately 50 pct. Copper shortages plus increased aluminum production are increasing aluminum for copper substitution by auto makers.

► One quick result of the steel industry's suggestions on improving production planning is the formation of a committee on structural steel. Big task of this committee will be to get more realism in statements of structural requirements. They'll need full cooperation from Defense Production Administration's requirements committee.

► Powder metal compacts of metals that are highly reactive to oxygen, hydrogen and nitrogen can be made solid by sintering at high temperatures. Alkaline earths, which are better "getters" than the metals being sintered are employed in a fluid state under inert atmosphere.

Although most tests have been made with titanium powder, other highly reactive metals like vanadium, hafnium and zirconium could be so treated.

8

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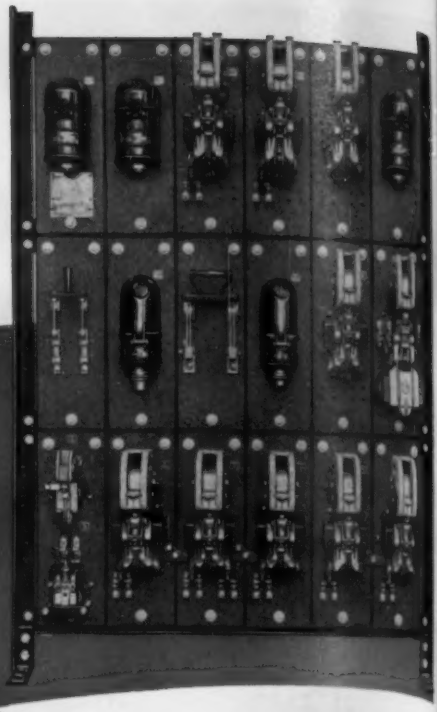

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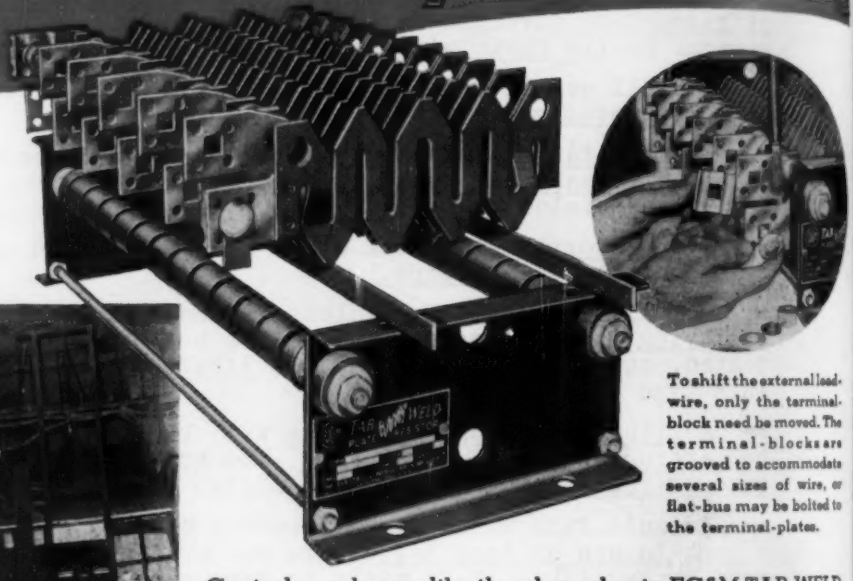

To shift the external lead-wire, only the terminal-block need be moved. The terminal-blocks are grooved to accommodate several sizes of wire, or flat-bus may be bolted to the terminal-plates.

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INDUSTRY: Visitors Praise U. S. Methods

More than 300 foreign technicians study U. S. methods . . . Are much impressed by industrial cooperation . . . Others expected to adopt some U. S. techniques—*By W. G. Patton.*

The excellent cooperation with U. S. industries as exemplified by the country's technical societies and trade press is not available anywhere else in the world.

Technical experts from other countries visiting America for the first time are amazed at the volume of goods produced, at the high productivity per worker and the precision timing of our assembly lines. They are also much impressed with the research programs being carried on by industry.

These observations were made by conferees to the World Metallurgical Congress which has recently engaged in study tours of American industrial, educational and government institutions. The group is concluding its tour this week after visits to the principal U. S. cities on the East Coast and the Middle West. The trip extended from Sept. 17 to Oct. 19.

More than 300 technical experts from practically every country in the world except Russia and her satellites are included in the 12 study groups. The visit was arranged by the American Society for Metals in cooperation with the Technical Assistance Div. of the Economic Cooperation Administration.

Learns Much—Alf Petterson, chief metallurgist, Stavanger Electric Steel Works, Jorpeland, Norway, pointed out that there are few continuous steel mills operating in Europe today. While a technical expert visiting here may not be able to apply directly the methods and processes observed in this country, seeing steel works operating first hand has greatly increased the reliability of his knowledge of U. S. steel operations, he said.

Probably the greatest advantage the steel engineer or metallurgist will have as the result of his visit, he believes, will be his increased ability to understand and interpret the U. S. technical papers he will continue to read after he gets back home.

The picture of technologists from different industrial firms working together was heretofore entirely unknown to him, Mr. Petterson said. No such organizations are in existence either in Norway or on the Continent. While he believes that uniformity of raw materials and their relatively low cost have been important contributors to the high U. S. output, free interchange of technical experience and data have also made a very substantial contribution.

Prof. A. Lefebvre, Faculte Polytechnique de Mons, Brussels, believes that at least three comparatively new U. S. steelmaking processes will be used to a limited extent in Europe in the near future. The use of oxygen in the blast furnace and openhearth, high top pressures in the blast furnace and carbon block linings will undoubtedly be tried out in European steelmaking operations, Prof. Lefebvre said.

GUESTS: At THE IRON AGE Annual Metal Show Party were some distinguished foreign visitors. Left to right: Claude Ventre, managing director, Hirson Steel Works, France; V. D. Talwar, chief manager, Steel Corp. of Bengal, India; Pierre Van Der Rest, general manager, Belgian Blast Furnaces and Steelworks Assn., Belgium; Alf Petterson, chief metallurgist, Stavanger Electric Steel Works, Norway; and Armand Peters, head engineer, Blast Furnace Dept., Hadir Works, Luxembourg.

Prof. Lefebvre called attention to the fact that because of the high cost of fuel in Europe it is essential to conserve heat. "We conserve our calories much more carefully than you do," he pointed out. The tremendous tonnage of steel produced; mechanization of operations in steel mills and resulting high productivity per worker are among the outstanding impressions he has gained during his tours of several steelmaking plants here.

Research experts have been impressed by the extent to which research is carried on by U. S. industry. There is no parallel activity in Europe, Cyril E. Phillips,

STEELWORKERS: Plan Wage Strategy

Wage campaign will officially open Nov. 14 . . . Executive board to meet at Atlantic City . . . Negotiations to start on or before Dec. 1 . . . Sweeping demands expected—*By J. B. Delaney.*

Steel labor will officially open its campaign for a better contract with the steel industry Nov. 14.

On that day the CIO United Steelworkers of America 33-man International Executive Board will meet at Atlantic City to outline formal contract demands. These recommendations will be finalized by the union's 163-member International Wage Policy Committee at the same place Nov. 15 and 16.

Negotiations will open on or before Dec. 1. The present contract expires Dec. 31, after which the union may strike if no agreement has been reached.

Principal demands are expected to include:

A "substantial" wage increase, probably 15¢ an hour.

An industry-wide rule of thumb for determining a fair day's work. This issue has been the cause of considerable friction, including strikes and slowdowns at the plants of some steel producers. It is a prerequisite to the setting up of uniform incentives.

A guaranteed wage.

The union also is expected to ask for a more liberal pension and hospitalization system, more paid holidays, higher premium pay for Saturdays, Sundays, and holidays.

Average hourly earnings of steel workers have more than doubled since 1937. Fourteen years ago steel labor was averaging 82.4¢ an hour. In August hourly payments to wage earners averaged $1.931. These figures are exclusive of other employment costs such as Social Security, pensions, and insurance.

During the same period, steel employment rose from 479,022 in 1937 to 679,100 in August, a record. The increase over last year's 503,309 workers was approximately 33 pct. Industry payroll in August was $246 million. In 8 months, the total payroll exceeded $1.9 billion, an increase of 24 pct over the same period in 1950 and nearly equal to the annual payroll in 1949.

Workers Back at Inland Steel

Eighteen thousand workers at Inland Steel Co.'s plant started filing back to work late last week as union and company officials agreed to arbitrate a dispute over incentive pay rates on the plant's No. 3 pickling line.

Company officials estimate a total of 70,000 tons of steel ingots were lost by the strike which ran through Monday to Thursday of last week. At week's end 20 out of 36 openhearths and 3 out of 8 blast furnaces were back in operation. Normal operations were expected to be resumed about 10 days after the strike ended.

Strike ended in time to prevent serious loss of raw materials from affecting the plant's future output. Seventy thousand tons of ore carried in leased vessels and four days' supply of scrap could not be unloaded during the strike.

Illegal Strikers Not Protected

National Labor Relations Board has ruled that an employer does not have to rehire workers who strike for an illegal union shop contract. Ruling was made in a case involving employees who struck against Mackay Radio and Telegraph Co. and the Commercial Cable Co.

Industry Wage Equalization O.K.'d

Wage Stabilization Board has agreed to consider higher wages for workers paid less than other workers on similar jobs within an industry or in any given area.

Want Automatic Pension Plan O.K.

Wage Stabilization Board has received a recommendation that new pension plans be automatically approved if their benefits do not exceed those of existing plans.

Continued

Dept. Scientific and Industrial Research, Glasgow, told THE IRON AGE. The extent to which broad, fundamental research has been stepped up here in recent years has been especially noteworthy, Mr. Phillips believes.

Auto Centers Impress — Alessandro Reggiori, vice-president, Societa Italiana Ernesto Breda, Milan, Italy, was favorably impressed by the General Motors technical center and the Chrysler engineering laboratories. Mr. Reggiori emphasized that it is essential to see U. S. technicians actually at work to appreciate how they use their facilities and the basic problems they are attempting to solve.

Included among the visitors was Tokushichi Mishima, professor of metallurgy, University of Tokyo. Prof. Mishima is the inventor of Alnico, a highly magnetic alloy used in many U. S. products. This is his first visit to U. S. in 16 years.

The high quality of our mass production products and the ability of technicians here to control production is most impressive, he pointed out. Japanese chemists and metallurgists also have the highest admiration for our laboratory equipment which is not available at present in Japan.

METALS: New Chrome Carbide Series

Carboloy tells of series 600 chrome carbides at Metal Show . . . Contain nickel binder but no tungsten or cobalt . . . List current uses . . . Carbide bearings described—*By W. G. Patton.*

A new family of man-created metals has been announced by Carboloy Dept. of General Electric Co. The series 600 chrome carbides and an expansion of the company's line of products and metallurgical materials were disclosed at the World Metallurgical Congress and Metals Exposition in Detroit, Oct. 15.

In addition to recent developments in tungsten carbide and the disclosure of technical details on chromium carbides and their use in specific industrial fields. Carboloy told of recent developments in carbide bearings, high temperature resisting carbides, thermistors for electrical applications, new metal-ceramics and carbide "welding" rods.

No Tungsten, No Cobalt—The series 600 chromium carbides have a nickel binder but contain no tungsten or cobalt. Made from powdered metals, they contain about 70 pct chromium by weight. Outstanding properties include excellent resistance to abrasion, erosion and corrosion, lighter weight, and resistance to oxidation at high temperatures. Coefficient of thermal expansion approximates that of steel. The material is non-magnetic.

Gage blocks, ring gages, plug gages and similar items are already being made of the new metal. Chrome carbide balls are being used with tungsten carbide valve seats by petroleum firms.

Corrosion Resistant—The carbide has withstood a 30 pct salt spray for 750 hr. Resistance to sulfuric acid is reported to be 30 times that of 18-8 stainless and three times that of conventional carbides. It also resists nitric acid and is practically inert to citric or lactic acid.

Oxidation is resisted up to 1832°F (1000°C). Machinability is about the same as tungsten carbides as is hardness at room temperature. The series 600 chrome carbides have far greater compressive strength than most steels. Density is about half the density of tungsten carbide.

Price per pound of the new material will be about the same as tungsten carbide.

Carbide — Carbide Bearing — Carboloy also announced the successful use of cemented tungsten carbide bearings under high speed, high load and temperature conditions where conventional bearings fail. Plain "sleeve type" bearings, consisting of carbide running against carbide, have been run successfully at speeds up to 30,000 rpm and loads up to 2000 psi. The new carbide metal will stand high unit pressures, has high strength at high temperatures, retains accuracy of fit under heavy loads and can be fitted to extremely close running tolerances.

In addition to the series 600 chrome carbides, Carboloy will produce titanium carbides, also high temperature resistant metals.

"Thermistors," now in the "engineering appraisal stage" at Carboloy, have electrical resistance which decreases with increasing temperature. These materials will be used as highly sensitive elements in flow meters, liquid level indicators and controls, time delay relays, voltage regulators, vacuum gages and switching devices. One grade has a resistance of only 1/100 ohm-in. at 600°F.

Flow Carbides — Carboloy has also completed laboratory development on a "weldable" tungsten carbide which can be flowed onto metal surfaces, using conventional shield or electric arc welding equipment. Experimental production will make limited quantities available to industry in welding rod form ranging from 1/16 in. to ¼ in. diam. These can be flowed onto metallic surfaces, such as steel or iron, blending with the base metal to produce a surface coating containing approximately 70 pct wear-resisting tungsten carbide.

SEES ALL: An Allis-Chalmers motorized industrial betatron undertakes production line inspection of heavy ordnance equipment at Continental Foundry & Machine Co., Coraopolis, Pa.

To Discuss Hot Atom Labs

Design of "hot" laboratories for research in radioactive materials will be a principal topic at a Washington meeting of building experts in late October.

Co-sponsors of the conference will be Atomic Energy Commission and American Institute of Architects. Contractors, architects, manufacturers, and press representatives will attend.

Inspect Laboratories — A working group from the Institute has visited AEC facilities at Argonne and Oak Ridge National Laboratories to inspect the buildings used in nuclear research.

—Expansion—

New Steelwork

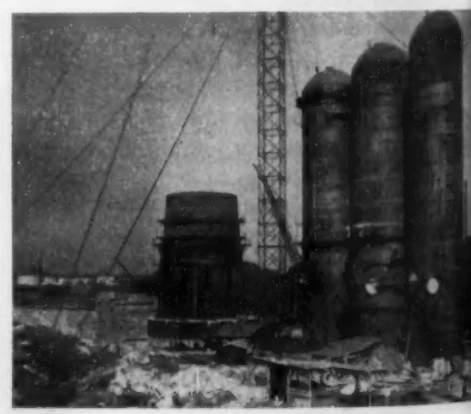
The steel industry is forging a huge growth that will give America a sturdier industrial backbone of steel. Not an uncommon sight across the land are blast furnaces going up section by section—or the steel lace of building framework soon to house a new force of furnaces and finishing mills.

New plants are being built and the industry is offsetting the high cost of expansion by improving

MORE COKE: Ford Motor Co. is spending $43 million to add 190,000 tons of finished steel capacity. Above, construction crews lay foundations for coke ovens at Ford's Rouge plant.

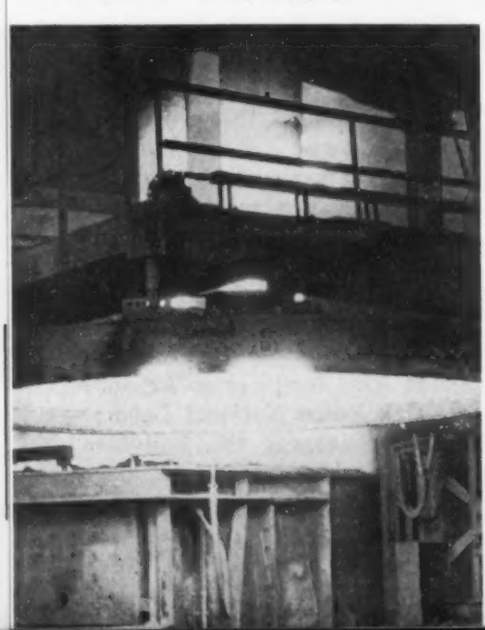
OPENHEARTHS: At Youngstown Sheet & Tube's Indiana Harbor plant million will go to expansion. Foreground of photo shows foundations for openhearths. In background steel framework for four more is already up.

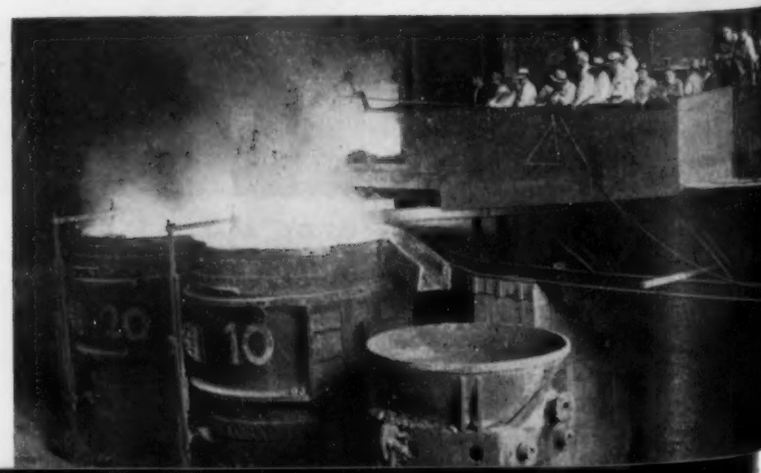
BYPRODUCTS: Expanding steelmaking by 675,000 tons a year, Republic Steel, Cleveland, is building new openhearths, blast furnaces and coke furnaces. The coking process provides valuable byproduct chemicals. To contain these, workmen are shown building foundations for storage tanks.



BLAST FURNACE: National Steel Corp.'s $150 million growth program is well underway. Here at Great Lakes Steel Corp., a subsidiary, three stoves stand completed. They will attend the blast furnace that is on its way up. (Below) One of two giant 550-ton openhearths at National Steel's Weirton Steel Co. get baptism under fire. First heat is poured while plant men watch.

ELECTRIC FURNACE: Improvement of old equipment is one way of beating the high cost of expansion. McLouth Steel Corp., Detroit, is increasing steel ingot production by one-third by altering its 85-ton electric furnaces from side to top charging.

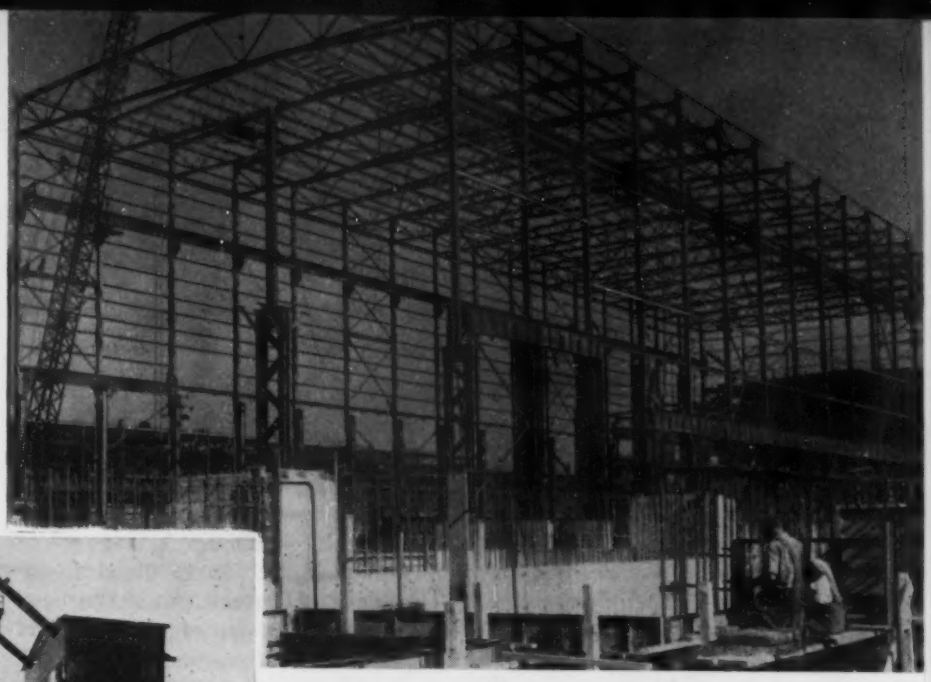




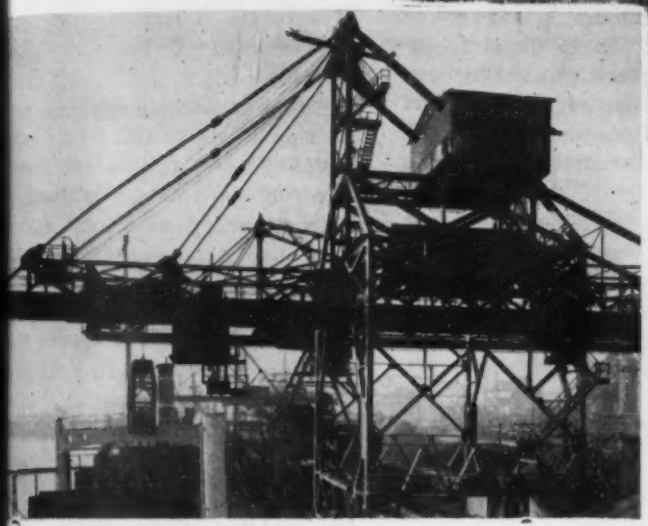
Growing Up

older facilities and building new shops adjacent to original plants. The greatest barrier to Red aggression can be found in new steelworks sprouting up.

When blast furnace and openhearth capacity rises so must that of attendant facilities—coke making plants, rolling mills, refractory production, ore unloading facilities. The pieces of expansion will soon fit together.

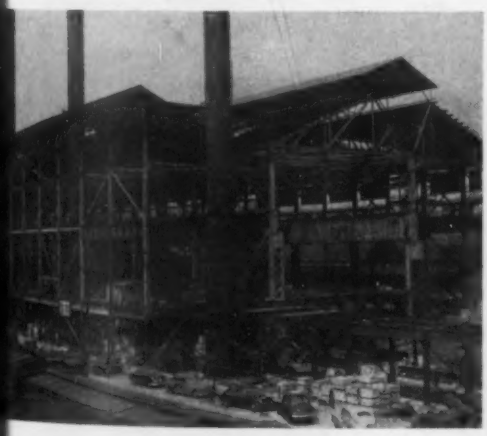


NEW MILL: U. S. Steel's new Fairless Works on the Delaware River will add 1.8 million tons new capacity. Construction was started Mar. 1. Here the steel skeleton of the sheet and tin mill building rises.



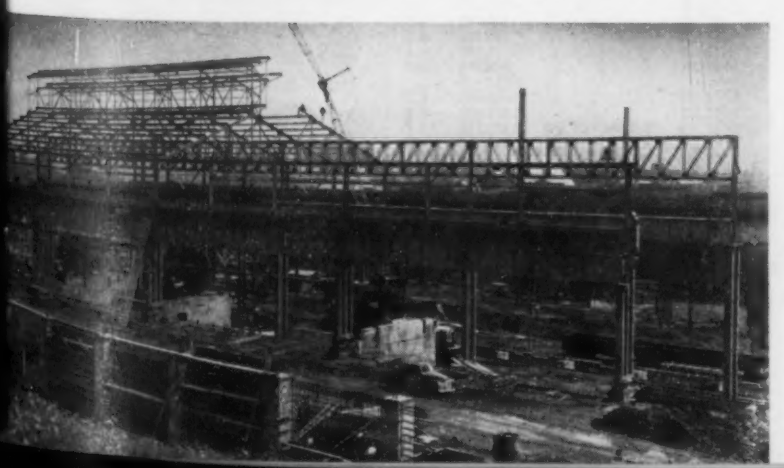
UNLOADER: An arm of steelmaking ore iron ore fleets plying oceans and reat Lakes. More ships being built means that more unloading facilities be installed. Shown is 15-ton ore unloader at Bethlehem Steel Co.'s w's Point plant.

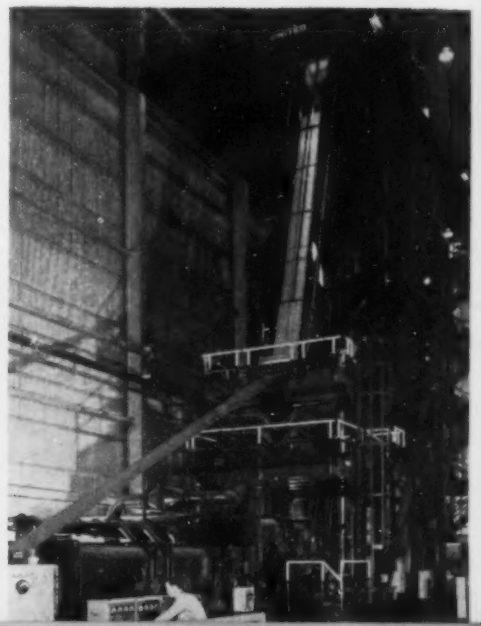
REFRACTORY: Inland Steel at Indiana Harbor had to build a man-made peninsula on its waterfront to find room to grow. With steel framework towering above them, workmen lay refractory brick to build stack flue tunnels for hot gases from the new openhearth shop.



NEW SHOP: Jones & Laughlin, Pittsburgh, has its new No. 4 openhearth shop on the road to completion. More than $100 million will be spent in 1951 and '52 in the Pittsburgh works. (Below) This new electric melting department is being completed by Allegheny Ludlum at Watervliet, N. Y. Second story will house three top-charge electric furnaces.

FINISHING: Steel strip mounts five stories as it enters the new continuous annealing line in the tin mill division of U. S. Steel's Gary, Ind., sheet and tin mill. Tin and black plate products pass through at the rate of 1000 fpm.





APPLIANCES: Shortage is Brewing

Dealer and distributor inventories okay now but cutbacks will strike . . . Alarming gap between production and sales . . . Refrigerators comparatively easy.—*By E. C. Beaudet.*

Despite fairly comfortable inventories in the hands of dealers and distributors at the present time, a shortage of home appliances will be felt at the beginning of next year and will grow during the first quarter of 1952.

This situation is developing just at the time when the manufacturers are being cut back further in the amount of steel, copper and aluminum they are allocated by the government.

Cutbacks—Last week the National Production Authority announced that makers of consumer durable goods will be getting 50 to 60 pct of the steel and about 50 pct of the copper and aluminum they were shipped in the first 6 months of 1950.

During the fourth quarter, appliance manufacturers have been allocated 58 pct of the steel, 54 pct of the aluminum and 46 pct of the copper received during the base period.

Production, however, will be at a rate 60 to 65 pct of the base period because of the use of materials in inventory and substitutions made for copper and aluminum in some parts.

Inventories Slide—In the face of such cuts in production it doesn't take long to run into a shortage. Following the slump in appliances which began last April, dealers started a wave of sales promotion in succeeding months to reduce high inventories.

By August, dealer and distributor inventories started on the down trend. Although not committing themselves to the high inventories of last January, dealers once again began to place sizeable orders.

At the same time appliance production began to fall behind sales and has been falling ever since. The width of this gap is alarming. Market surveys show that, during the fourth quarter, sales of automatic washers will exceed production by 61 pct. Based on fourth quarter materials allotments, this will rise to 73 pct during the first quarter of next year.

On dishwashers the figures are said to run 48 pct in the fourth quarter and 60 pct in the first. The amount by which electric range and water heater sales production will lag behind sales is reported at 34 and 53 pct, respectively, for the two periods.

Such figures do not mean that inventories will be reduced in the same proportion but give an indication of the rate at which they are being diminished. By the first of the year automatic washers and dryers will be extremely tight.

Consumers are already experiencing a wait of several weeks for delivery of these items. By the beginning of the second quarter of next year the other appliances will be in the same condition.

Refrigerators Easier—Refrigerators, however, still continue to be easy and no immediate shortage is expected. Since they are the backbone of the industry, manufacturers overproduced on them in anticipation of materials cutbacks.

Sales will be ahead of production by 15 pct during the fourth quarter and inventories will remain high. At present levels of production they won't run into a

STEEL: Finished Shipments Up in August

As Reported to the American Iron & Steel Institute

STEEL PRODUCTS	CURRENT MONTH Carbon	Alloy	Stainless	Total	Pct of Total Shipments	TO DATE THIS YEAR Carbon	Alloy	Stainless	Total	Pct of Total Shipments
Ingots	101,832	18,929	1,334	122,095	1.8	673,003	157,309	12,903	843,215	1.6
Blooms, slabs, billets, tube rounds, sheet bars	147,429	50,543	1,453	199,425	3.0	1,111,090	376,752	12,362	1,500,204	2.8
Skelp	12,018	.....	.....	12,018	0.2	97,566	.....	.....	97,566	0.2
Wire rods	66,464	781	802	67,847	1.0	548,045	11,186	3,278	562,509	1.1
Structurals	403,417	3,199	6	406,622	6.0	3,216,752	45,798	53	3,264,603	6.2
Steel piling	41,297	.....	.....	41,297	0.6	285,121	.....	.....	285,121	0.5
Plates	661,434	28,703	1,073	691,210	10.2	4,950,418	270,415	11,869	5,232,702	9.9
Rails—standard	157,110	17	.....	157,127	2.3	1,147,869	140	.....	1,148,009	2.2
Rails—all other	8,275	6	.....	8,281	0.1	86,144	46	.....	86,190	0.2
Joint bars	11,888	.....	.....	11,888	0.2	89,375	.....	.....	89,375	0.2
Tie plates	34,571	.....	.....	34,571	0.5	304,626	.....	.....	304,626	0.6
Track spikes	13,927	.....	.....	13,927	0.2	111,906	.....	.....	111,906	0.2
Wheels	32,078	5	.....	32,083	0.5	264,539	140	.....	264,679	0.5
Axles	16,125	36	.....	16,161	0.2	148,615	431	.....	149,046	0.3
Bars—hot rolled	547,031	193,053	3,946	744,030	11.0	*4,358,446	1,508,124	27,947	*5,894,517	11.2
Bars—reinforcing	183,774	.....	.....	183,774	2.7	1,253,385	.....	.....	1,253,385	2.4
Bars—cold-finished	140,185	30,316	3,558	174,059	2.6	1,026,045	222,870	27,644	1,276,559	2.4
Bars—tool steel	2,976	12,012	.....	14,988	0.2	*23,041	*93,033	.....	*116,074	0.2
Standard pipe	262,397	37	3	262,437	3.9	1,955,512	1,072	31	1,956,615	3.7
Oil country goods	145,178	14,252	.....	159,430	2.4	1,109,803	137,263	.....	1,247,066	2.4
Line pipe	244,213	85	.....	244,298	3.6	1,952,112	779	.....	1,952,891	3.7
Mech. tubing	59,324	28,100	570	87,994	1.3	450,304	194,317	4,146	648,767	1.2
Pressure tubing	27,121	2,659	936	30,716	0.5	177,853	14,424	6,776	199,053	0.4
Wire—drawn	276,643	3,801	2,697	283,141	4.2	2,110,788	35,364	20,861	2,167,013	4.1
Wire—Nails, staples	74,580	.....	2	74,582	1.1	578,099	.....	27	578,126	1.1
Wire—barbed, twisted	20,386	.....	.....	20,386	0.3	150,104	.....	1	150,105	0.3
Wire—woven fence	34,742	.....	.....	34,742	0.5	286,636	.....	.....	286,636	0.5
Wire—bale ties	10,883	.....	.....	10,883	0.2	72,054	.....	.....	72,054	0.1
Black plate	89,361	.....	.....	89,361	1.3	646,961	.....	.....	646,961	1.2
Tin & terneplate—hot-dipped	160,354	.....	.....	160,354	2.4	1,144,338	.....	.....	1,144,338	2.2
Tin plate—electrolytic	270,105	.....	.....	270,105	4.0	1,913,491	.....	.....	1,913,491	3.6
Sheets—hot rolled	629,438	21,835	3,424	654,697	9.7	*5,400,244	*205,079	27,395	*5,632,718	10.7
Sheets—cold rolled	753,746	8,702	8,240	770,688	11.4	6,458,195	79,735	65,794	6,603,724	12.5
Sheets—galvanized	190,578	.....	.....	190,578	2.8	1,378,217	907	.....	1,379,124	2.6
Sheets—other coated	23,428	.....	.....	23,428	0.4	175,920	.....	.....	175,920	0.3
Sheets—enameling	11,571	.....	.....	11,571	0.2	135,479	.....	.....	135,479	0.2
Electrical sheets, strip	13,211	54,832	.....	68,043	1.0	98,598	419,946	.....	518,544	1.0
Strip—hot rolled	181,677	3,023	768	185,468	2.7	1,425,111	*27,902	5,215	*1,458,228	2.8
Strip—cold rolled	171,345	2,829	17,110	191,284	2.8	*1,258,500	*19,857	132,875	*1,411,232	2.7
TOTAL	6,232,112	477,755	45,722	6,755,589	100.0	*48,576,305	*3,822,889	389,177	*52,758,371	100.0

During 1950 the companies included above represented 99.0 pct of the total output of finished rolled steel products as reported to the American Iron and Steel Institute.

* Revised.

shortage until the middle of 1952.

Because of the cutbacks in production the problem of steel procurement has become less troublesome. Manufacturers no longer have to scramble for gray market or foreign steel to meet production schedules and are not renewing conversion commitments once they are completed.

Aluminum:

May further alter product mix to get more rods, bars, and ingots.

Control officials are debating with industry over methods of providing greater quantities of aluminum bar, rod, and ingot to meet casting needs for production of aircraft and engines.

Current requirements of 115,000,000 lb of ingot, rod, and bar by the castings producers will be increased by 25,000,000 lb in first quarter 1952.

Defense Production Administration officials have been considering a cutback of 30,000,000 lb in sheet production to meet the expected deficiency.

Industry Objects—Industry advisers, however, tell officials that this will impose too great a hardship on some sheet users as well as on producers. They say that some of their sheet mills are now running at only about 35 pct of capacity.

Fairless Applauds Competition

At dedication ceremonies of National Radiator's new plant at Duncansville, Pa., last week, Ben Fairless, U. S. Steel president, cited that firm as an example of a small plant that succeeded in competing with bigger industry.

He said the "Calamity Johns of this country have never quite succeeded in foisting upon the American people the greatest hoax of all—the idea that big business grows only by crushing small business. . . . When any nation stops producing new business units it must perish just as surely as it would if it had stopped producing children."

TRADE GROUP: Aim at War Contracts

Local commerce groups aim at war subcontracts . . . New York association promotes subcontracts . . . Has storehouse of facts on clients . . . What it is now doing.—*By T. Metaxas.*

The small businessman who has been knocking hard on the back door of early defense production is preparing to throw out the grappling hooks for more subcontracts through his representative—the local trade and commerce association.

This is the small manufacturer's defense against being snubbed when subcontracting volume grows next year. Serving as consultants on business trends and legal and tax matters in quieter times, the commerce and trade associations are now spreading defense contract information and coordinating subcontracting inquiries.

Valuable Files—The sum of manufacturing facilities files accumulated by the many industry associations throughout the country will be a valuable index to the skills and productive capacity of small business on the whole. Thus all of America's industry can be flushed out quickly when needed.

With a clientele of 4000 firms, mostly machine shops and metalworking companies, the Commerce and Industry Assn. of New York is using its large storehouse of facts on file to fit its members as neatly as possible into presently limited defense production.

It can determine eligibility of manufacturers to perform subcontracting work by cross-index files that show production experience, equipment down to the last screw machine, size of plants and labor force. With all this background material, the association is cocked for defense action.

"Any humble opinions, Mr. Peebles?"

Promotion—Since small business is not exactly being pelted with subcontracting inquiries, the association's Industrial Development section, headed by H. K. Astwood, is focusing on stimulation of subcontracts.

For instance, when machine tool makers were finally furnished incentive to subcontract through OPS pricing relief, Mr. Astwood immediately sent letters to machine builders offering the industrial services of the New York area. Response was eager. Several prominent machine tool builders wrote in stating the jobs they had open. These varied from machining of castings to building the complete tool.

Mr. Astwood disposed of the light work quickly but the building of complete assemblies had its difficulties. Only plants with "heavy" facilities and experience in producing other complex machinery could do the job.

Not Hit or Miss—In the promotion phase of subcontracting, Industrial Development is in touch with Army Ordnance and Air Force agents and recipients of prime contracts. When a prime is induced by an attractive form letter to find out what New York industry has to offer, Mr. Astwood follows through with a list of possible subcontractors.

This is not a hit or miss proposition—for Industrial Development's filing system lists everything about firms but the owners' family histories.

CAR BUILDERS: Face Large Cutbacks

Cutbacks to result from smaller quotas of steel, copper, aluminum in first quarter 1952 . . . Face loss of skilled men . . . Builders unable to cash some fourth quarter tickets.

Freight car builders will fall far short of the programmed 10,000-per-month goal during the first quarter of 1952. As a result, some of their skilled manpower may move on to other industries.

The cutback will be necessary because National Production Authority reduced first quarter rail equipment allocations to 1,640,000 tons of steel, 86 million lb of copper and 6 million lb of aluminum.

Output Basis—These materials are allotted on the following production basis: Road-type freight cars, 18,000; industrial-type freight cars, 250; tank cars, 2500; passenger cars, 100; road-type locomotives, 636; industrial-type locomotives, 50; and 300,000 tons of rails.

In addition, sufficient tonnages will be earmarked for the production of 1200 freight cars and 60 locomotives for export, and another 54 locomotives for service in the Army.

May Lose Workers—This total of 21,450 freight cars, representing a 3000-unit cutback from fourth quarter, places before manufacturers of parts and components the problem of how to keep their plants going and to hold their work force together.

Unless the program is expanded, some companies told NPA, they may be forced to convert to other types of production. At least one company is planning to close down one shift because of the allotments cutback.

Criticize NPA—Locomotive builders are in much the same situation, NPA has been told. The cutback in locomotives from the fourth quarter amounts to about 230 units. On the assumption that the company would receive the same percentage of materials, one firm says it will have to close down its Cleveland plant.

It was pointed out to NPA at an industry advisory committee meeting last week that agency wires seem to be crossed somewhere along the line—that the CMP cutback in production of industrial types of locomotives and freight cars is in conflict with Office of Defense Mobilization's program for expansion of minerals production.

Backlogs Grow—Meanwhile, the backlog of freight car orders increased to more than 141,000 units. Backlog of locomotive orders at the beginning of the fourth quarter stood above 1550, nearly 200 more than a year ago.

Making matters worse for the railway equipment builders, manufacturers claim that they were unable to cash CMP tickets and to get on mill schedules for a total of 150,000 tons of allotted fourth quarter materials.

Second Look—In making announcement of over-all first quarter allocations, NPA strongly indicated that there would be no supplemental allocations for the first quarter.

But DPA has agreed to take another look at first quarter needs of the railway equipment industry. And NPA has promised to put an expediter to work in helping get tickets cashed.

Steel Price Ceilings Coming Soon

Steel mill products are on the list for tailored price control, as Office of Price Stabilization begins a broad program of emphasizing dollars-and-cents ceilings for manufactured and processed items.

A specific regulation for steel mill products is being studied now. OPS wants to have its order ready before wage negotiations are in full swing later this year.

In writing tailored regulations for steel mill and other products, there will be no attempt to set prices so high that Capehart amendment provisions can't be applied, according to E. F. Phelps, Jr., director of OPS Office of Price Operations. Similarly, Phelps says, the agency will study pricing at length before agreeing to apply the earnings standards rule to steel mill prices.

Steel will not be the first commodity affected by the more sweeping plan for tailored regulations. Some of the early ones, Phelps predicts, probably will be textiles and apparel, paper items, and lumber and forest products.

He also says OPS will "have to be satisfied" with regulations controlling as much as 85 pct of an industry, while products of the other 15 pct remain at premium levels.

Industry Controls This Week:

NPA Orders

NPA Reg. 1, Amend.—Broadens scope of inventory controls. Table IA is extended to bring many metals, minerals, and chemicals under "practical working inventory" restrictions. Establishes Table IB to make certain items subject to specific calendar day levels. Table II lists materials subject to special inventory regulations and names the pertinent regulations.

OPS Orders

CPRs 43, 48, 53—Amended to raise ceiling prices on lead, lead scrap, zinc scrap and remelt zinc.

Amend. 4 CPR 5—Sets 3 new nonferrous scrap grades, minor changes in definitions.

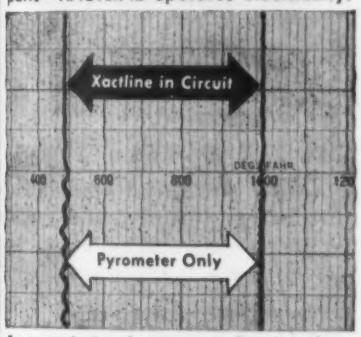
Amend. 5, CPR 5—Joins three open-hearth scrap grades, makes No. 1 bundles prime grade, cuts foundry differentials.

Automatic
"STRAIGHT-LINE"
TEMPERATURE CONTROL
with
XACTLINE

ELIMINATE
Overshooting
Undershooting

Are you going to continue to put up with that troublesome overshooting and undershooting inherent in your conventional pyrometer control—especially when it is so easy to eliminate that saw-tooth effect?

Put XACTLINE in the control circuit. XACTLINE anticipates the temperature changes—before they occur. And too, it nullifies the varying amounts of thermal lag, residual heat, and mechanical lag—producing a short on-off cycle resulting in "Straight-Line" temperature control. This performance is possible because there is no dependence upon mechanical parts—XACTLINE operates electrically.



Exact reproduction of temperature chart for a heating process showing the comparison of the "Straight-Line" temperature control produced by XACTLINE and the saw-tooth curve obtained with only conventional control.

XACTLINE is applicable to any indicating or recording pyrometer control of the millivoltmeter or potentiometer type. It should be used wherever close temperature control is required—any type of electrically heated oven, furnace, kiln, injection molding machine, and fuel-fired furnaces equipped with motor-operated or solenoid valves.

XACTLINE is a complete unit. No adjustment or coordination with the control instrument is required regardless of the size of the furnace, length of the heating cycle, or size of the load. Installation is very simple—can be either flush or surface mounted.

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Controls

Lead, Zinc:

OPS raises ceilings on scrap to align with basic metals.

Secondary lead and lead scrap, zinc scrap and remelt zinc will be sold at ceiling prices raised to keep them in line with prices of basic metals.

Office of Price Stabilization, which authorized a 2¢ per lb price increase for primary lead and slab zinc on Oct. 2, has ordered an identical increase for lead scrap materials, secondary lead, and antimonial lead.

Remelt zinc with a minimum zinc content of 97.5 pct has a new ceiling price of 19.25¢ for quantities of 10,000 lb or more. Remelt zinc with a lower zinc content is priced at 14.25¢ in quantities of at least 10,000 lb.

Unsweated zinc dross and zinc die-cast slabs have a new price ceiling of 13.75¢ per lb, an increase of 1.5¢. All other zinc scrap grades received a 1¢-per-lb price boost.

Setting of the new ceilings required amendments to Ceiling Price Regulations 43, 48, and 53.

Sulfuric Acid Consumption Cut

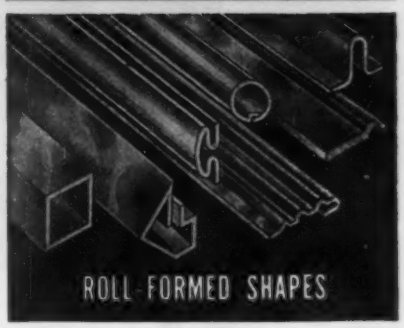
Consumption of sulfur for production of sulfuric acid or carbon bisulfide will be restricted to 90 pct of the 1950 rate, probably beginning Nov. 1.

Adjustments will be made, however, where sulfuric acid is needed for production of steel, nonferrous metals, petroleum, synthetic rubber, and military explosives.

In line with proposals submitted by the International Materials Conference, Office of International Trade has set the fourth quarter export quota at 240,000 long tons of crude and 7500 tons of refined sulfur. Same figure held for third quarter and is 10 pct less than 1950 rates.

Slight increase in native production of about 60,000 tons is expected currently to bring 1951 crude production to more than 5,250,000 long tons—about 90 pct of world supply.

PROMPT DELIVERY!
FOR "D. O." WORK



Let Werner light metal shapes help you meet "D.O." deadlines.

You can get prompt delivery of "custom" shapes in extruded aluminum, as well as roll-formed aluminum, stainless steel, brass, zinc and copper. Shapes are manufactured to close tolerances, to your exact specifications. Quality is assured by Werner's extensive manufacturing and engineering experience, plus full production facilities, including tool-and-die-making equipment.

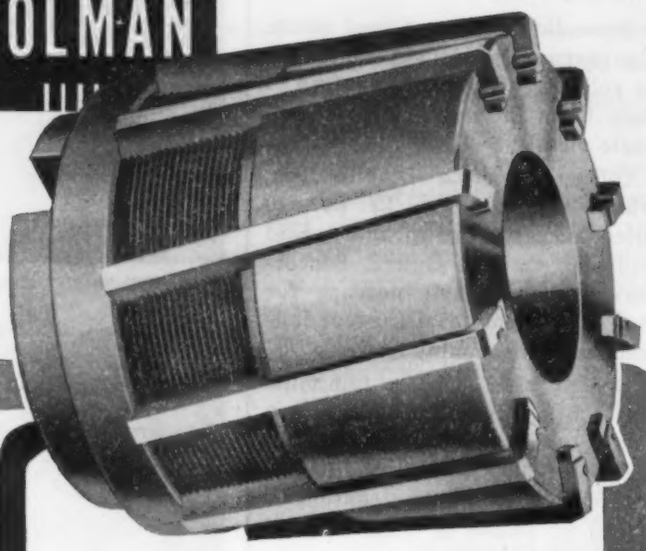
For an estimate, send drawing and specifications, plus data on quantity, finish, length, etc. Werner can perform the following secondary operations—bending, drilling, punching, cutting, counter sinking and welding. Finishes—as extruded, polished or anodized.

R. D. WERNER CO., INC.
295 FIFTH AVE., N. Y. 16, N. Y. • PHONE MU 6-2595
MANUFACTURERS OF ALUMINUM EXTRUSIONS AND ROLL-FORMED SHAPES

Send to:
R. D. WERNER CO., Inc., Dept. 1A
295 Fifth Ave., New York 16, N. Y.
FREE bulletins describing manufacturing facilities and telling when to choose extruded or rolled shapes.

NAME_____
COMPANY_____
ADDRESS_____
CITY_____ ZONE____ STATE_____

BARBER
COLMAN



fine-cut
Reamers

FOR ULTIMATE IN FINE FINISH
AND CLOSE LIMITS OF ACCURACY

QUALITY REAMED HOLES
Plus
LOW MAINTENANCE, OPERATING COSTS

Pin and wedge design affords more blades per reamer diameter which in turn makes for better finish and maintenance of size. Easy adjustment, quick set-up and sturdy, non-shift blade mounting provide long economical operation.

AVAILABLE FROM STOCK FOR IMMEDIATE SERVICE

BARBER-COLMAN COMPANY
5910 ROCK STREET
ROCKFORD, ILLINOIS

Auto CPR Effective Nov. 4

Passenger automobile resellers are allowed until Nov. 4 to post itemized price lists based on a new dollars-and-cents ceiling price regulation.

As issued by Office of Price Stabilization, the order lists several elements entering into computation of new automobile prices:

(a) "Basic price" of the automobile with standard equipment.

(b) All items of extra, special or optional equipment sold by the manufacturer for use on the car.

(c) Transportation costs.

(d) Federal excise taxes on the vehicle and equipment.

(e) Any state or local taxes on sale of the automobile or equipment.

(f) Charge for preparing and conditioning the car for delivery, if such preparation is required.

(g) Any other service or equipment item requested in writing by the customer.

SEC Data to Guide OPS Policy

Data collected by Securities and Exchange Commission for Office of Price Stabilization will be used by OPS for "policy purposes" in meeting changing economic conditions, the agency says.

The pricing organization, in an effort to clear up uncertainties as to why it issued Reporting Regulation 1, says the order "merely makes mandatory" the filing of certain financial information with SEC.

Further Nickel Curbs Planned

Additional restrictions are in the making to further restrict production of nickel-bearing alloys for civilian uses.

Melt schedules for first quarter 1952 reflect increasing demands for high nickel alloys by the military for jet aircraft and similar uses and new requirements for atomic energy.

All nickel available is being allocated to the steel mills. Next move by NPA will be based on a special report by the mills on capacity and how much additional

onnage could be produced if more nickel were obtained.

There seems to be no difficulty in sight for straight chromium steel during first quarter for essential uses, NPA believes.

Office Supplies Not Essential

National Production Authority has ruled that business machines, typewriters, desks, and other office furniture and supplies are not production equipment. Priority ratings cannot be used in their procurement.

Revised Allotment Symbols

The new allotment and DO symbols and the programs to which they apply, as of Oct. 8, are:

MP Allotment and/or DO Rating Symbol	*Major Program Involved*	*Agency or Industry Div., Etc.*
A-1	Aircraft	Defense Dept.
A-2	Guided Missiles	Defense Dept.
A-3	Ships	Defense Dept.
A-4	Tank-Automotive	Defense Dept.
A-5	Weapons	Defense Dept.
A-6	Ammunition	Defense Dept.
A-7	Electronic and Communications Equip.	Defense Dept.
A-8	Fuels and Lubricants	Defense Dept.
A-9	Clothing & Equipage	Defense Dept.
B-1	Building Supplies and Equipment for Constr.-Troop	Defense Dept.
B-2	Subsistence	Defense Dept.
B-3	Transportation-Equip.	Defense Dept.
B-9	Production-Equip.	Defense Dept.
C-2	Defense Dept. Constr.	Defense Dept.
C-3	MRO	Defense Dept.
C-9	Misc.	Defense Dept.
Z-9	Production Equip. for Certain Private Contractors	Defense Dept.
D-1	Civil Works-Corps of Engineers	Army Dept.
D-2	Panama Canal Co.	Army Dept.
D-3	Domiciliary Bldg. Old Soldiers Home	Army Dept.
E-1	Construction	AEC
E-3	Operations (Including MRO)	AEC
E-3	Privately-Owned Facilities	AEC
F-1	Construction	Federal Civil Defense
F-2	Other	Federal Civil Defense
F-3	Construction	Federal Security Admn.
F-4	Other	Federal Security Admn.
F-5	Construction	General Services Admn.
F-6	Other	General Services Admn.
F-7	Construction	Veterans Administration
F-8	Other	Veterans Administration
F-9	Construction	Housing & Home Finance Agcy.
G-1	Other	Housing & Home Finance Agcy.
G-2	Construction	Agriculture Department
G-3	Other	Agriculture Department
G-4	Construction	Defense Transport Admn.
G-5	Other	Defense Transport Admn.
G-6	Construction	Canada
G-7	Other	Canada
G-8	Shipyard Const.	Maritime Admn.
H-1	Construction	PAD
H-2	Other	PAD, Interior Department
H-9	MRO (Order M-46)	PAD
S-1	"B" Products	PAD
H-3	Construction—Major Plant Additions (Order M-50)	Defense Elec. Power Admn.

Turn Page

YOU CAN'T RISK FIRES NOW!

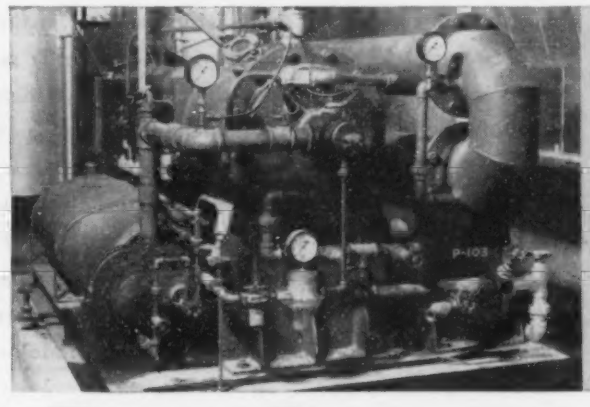
A portable R-C Inert Gas Generator used for purging operations and stand-by protection in large gas-producing plant. Capacity 15,000 cfh.

Today's urgent production demands can tolerate no unwarranted risk of interruption by explosions which might cause even small fires or other plant damage. Against such hazards, R-C Inert Gas Generators provide positive, economical protection.

This protection is essential in plants where inflammable gases, liquids, explosive dusts and other dangerous materials are handled, processed or stored. Available either in stationary or mobile units, R-C Inert Gas Generators greatly reduce the risks from fires caused by explosions. They are compact, simple and sturdy in construction and operate at extremely low cost. Available in capacities from 1,000 to 35,000 cfh.

If your operations involve materials or processes which might cause explosion-produced fires, investigate the protection afforded by R-C Inert Gas Generators. Installation costs in many cases can be offset by insurance savings. Ask us for details.

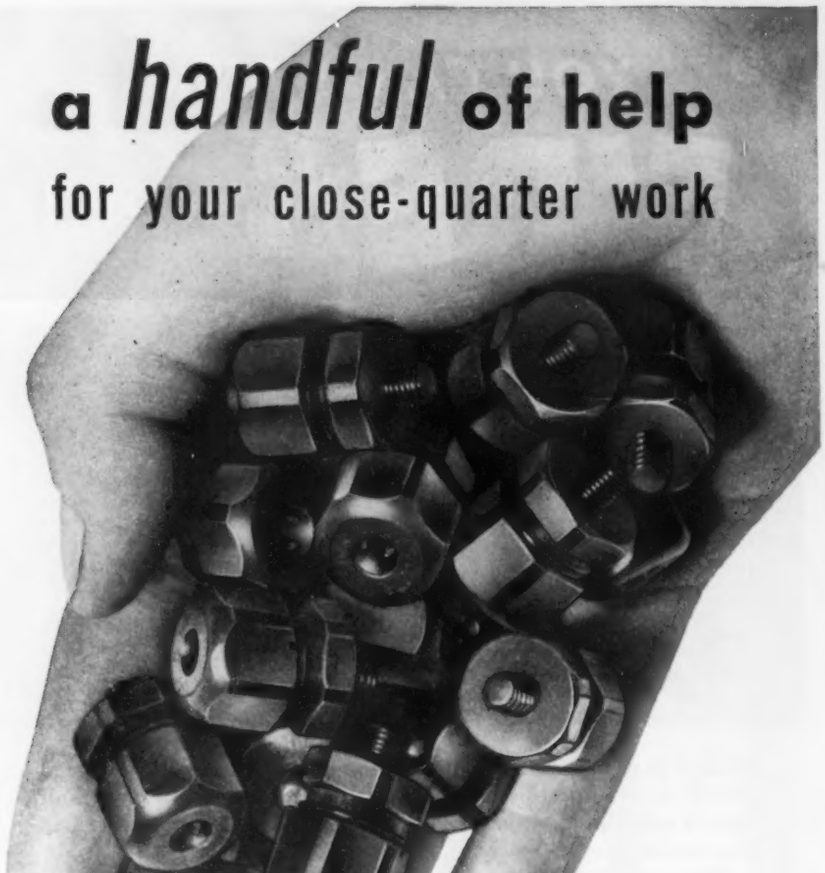
ROOTS-CONNERSVILLE BLOWER CORPORATION
510 Ohio Avenue, Connersville, Indiana



Installation of three R-C Inert Gas Generators similar to this one helped one large plant save $6,000 per month insurance premiums, as well as substantially reduce danger of production losses caused by explosion or fires. Capacity of each unit, 6,000 cfh.

ROOTS-CONNERSVILLE
BLOWER BUILDERS SINCE 1854
ONE OF THE DRESSER INDUSTRIES

a *handful* of help
for your close-quarter work



BUCKEYE
PATENTED
Cone-Jaw Chucks
CAPACITY TO ¼"

A small chuck—just 13/16" O.D.—designed to do a big job, especially when tool space is limited. Low in first cost, lower still in maintenance—jaws are easily replaced in one minute without using any tools. Rolling action of cone jaws as chuck is tightened presents a new face to tool shank each time, reducing jaw wear, and pulls shank firmly into recess in chuck, insuring true alignment. For use with all Buckeye 30°, 90°, 360° adjustable, angle head tools—easily adapted to other makes. Thousands of Buckeye Cone-Jaw Chucks are saving time and money in hundreds of plants today—how about yours?

Buckeye Tools CORPORATION
DIVISION 11 • DAYTON 1, OHIO

Portable Air and Electric Tools for Industry

Controls

CMP Allotment and/or DO Rating Symbol	*Major Program Involved*	*Agency or Industry Div., Etc.*
H-4	Minor Requirements Including MRO (Order M-50)	Defense Elec. Power Admn.
H-5	Construction	Defense Minerals Admn.
H-6	MRR (Order M-50)	Defense Minerals Admn.
H-7	Construction	Defense Solid Fuels Admn.
H-8	Other	Defense Solid Fuels Admn.
J-1	Ship Building for Maritime Account	Commerce Dept. Maritime Admn.
J-2	Private Ship Building Maritime Sponsored	Maritime Admn.
J-3	Construction	Public Roads Bureau
J-4	Other	Public Roads Bureau
J-5	Construction	CAA & CAB
J-6	Other	CAA & CAB
J-8	Departmental Programs (all)	Interior Dept.
J-9	Construction	Defense Fisheries Admn.
W-1	Military Equip. and Supplies Being Purchased by Foreign Govts. through Domestic Commercial Channels	Army Dept.
W-2	All Programs	International Trade (Office of)
W-3	Civilian Requirements of Foreign Areas under Military ABM	Army Dept.
W-4	All Programs	ECA
J-7	Al	State Dept., Voice of America
T-8	Construction	Water Resources Div.
T-9	MRO	Water Resources Div.
U-1	MRO & Operating Construction (M-77 Self Assigned)	Communications Equip. Div.
U-2	MRO & Operating Construction (U-2 Application-Authorization M-77)	Communications Equip. Div.
U-3	MRO (Order M-73)	Communications Equip. Div.
U-4	Construction	Railroad Equip. Div.
U-5	Construction	Industrial Expansion Div.
U-6	Industrial Plants, Factories, Facilities	Construction Controls Div.
U-7	Residential Structures other than Multi-Unit Buildings	(Direction 1 to CMP Reg. 6)
U-8	All Other Types of Bldgs., Structures, Projects, except those Table 1 of M-4A and Multi-Unit Bldgs.	(Direction 1 to CMP Reg. 6)
U-9	Material for Repairs or Replacement of Supplies or Equipment due to Flood Conditions	(Direction 1 to CMP Reg 6)
X-1	Laboratories	(Direction 2 to CMP Reg. 5)
X-2	For Producers of Non-Controlled Materials for use as Production Material	(Order M-71)
X-3	Field Offices	
X-4	Material for Repair or Reconstruction of Buildings or Projects due to Flood Damage	Commerce Dept.
X-5	To Identify: Steel Products Purchased by One Steel Producer from Another (Steel Producer) for Resale Without Further Conversion	(Direction 2 to CMP Reg. 5)
X-6	To Identify: Brass Mill Products and Wire Mill Products Required by Distributors to Replenish Stocks (Order M-28) and (Order M-86)	
X-7	Aluminum for Destructive Uses (M-84)	
Z-1	Priorities and Directives (all Except Basketing)	
Z-8	Basketing—NPA Reg. 2	
Z-9	See Defense Dept., Production Equip.	

MP Allotment and/or DO Rating Symbol	*Major Program Involved*	*Agency or Industry Div., Etc.*

Symbol	Purpose
M	To transfer aluminum between (a) aluminum producers, (b) aluminum producers and aluminum smelters, and (c) aluminum producers and aluminum distributors.
C	To transfer steel between mills for processing into another shape or form which is still a controlled material.
E	Prefix to warehouse serial number on shipments to replenish warehouse stocks of controlled steel products.
M	Identifies purchase of controlled and non-controlled materials by controlled materials producers for use as production materials (except for aluminum acquired by use of symbol "AM"). (See Direction 2 to CMP Reg. 1.)
I	Small Users (See Direction 1 to CMP Reg. 1).
E	Repair Parts and Materials for Repairmen. (See CMP Reg. 7.) (Not under CMP Reg. 5.)
RO	CMP Reg. 5—Self Assigned. "B" Product numbers on next page.

CMP Allotment and/or DO Rating Symbol	*NPA Industry Division*
K-1	Agricultural Machinery & Implements
K-2	Aircraft
K-3	Aircraft
K-4	Aluminum & Magnesium
K-5	Building Materials
K-6	Building Materials
K-7	Building Materials
K-8	Chemicals
K-9	Communications Equip.
L-1	Construction Machinery
L-2	Mining Machinery
L-3	Consumers Durable Goods
V-3	Consumers Durable Goods
L-4	Consumers Durable Goods
V-4	Consumers Durable Goods
L-5	Consumers Durable Goods
L-6	Consumers Durable Goods
L-7	Consumers Durable Goods
L-8	Containers & Packaging
L-9	Containers & Packaging
M-1	Containers & Packaging
V-1	Containers & Packaging
M-2	Copper
M-3	Electrical Equip.
M-4	Electrical Equip.
M-5	Electrical Equip.
M-6	Electrical Equip.
V-7	Electronics
M-8	Electronics
M-9	Electronics
N-1	Engine & Turbine
N-2	Engine & Turbine
N-3	Engine & Turbine
N-4	General Components
N-5	General Components
N-6	General Components
N-7	General Components
N-9	General Industrial Equip.
P-2	General Industrial Equip.
P-3	General Industrial Equip.
P-4	General Industrial Equip.
P-5	General Industrial Equip.
T-5	Iron and Steel
T-6	Iron and Steel
T-7	Iron and Steel
P-8	Leather & Leather Products
V-8	Leather & Leather Products
P-9	Lumber & Lumber Products
N-8	Metal Working Machinery
P-1	Metal Working Machinery
P-6	Metal Working Machinery
R-1	Miscellaneous Metals & Minerals
R-2	Motion Picture Photographic Products
R-3	Motor Vehicle
R-4	Motor Vehicle
V-5	Motor Vehicle
R-6	Motor Vehicle
R-7	Ordnance & Shipbuilding
R-8	Ordnance & Shipbuilding
R-9	Ordnance & Shipbuilding
S-1	Petroleum Administration for Defense
S-2	Printing and Publishing
S-3	Pulp, Paper and Paper Board
S-4	Railroad Equip.
S-5	Railroad Equip.
P-7	Railroad Equip.
S-6	Rubber
S-7	Scientific & Technical Equip.
S-8	Scientific & Technical Equip.
S-9	Scientific & Technical Equip.
T-1	Service Equip.
V-6	Service Equip.
T-2	Service Equip.
T-3	Textile
T-4	Tin, Lead and Zinc

"Cleaning the World"

Wyandotte Nordall

This New **Emulsion Cleaner** Gives You Extra Advantages—

FREE!

Wyandotte Nordall is an emulsion cleaner so outstanding in performance that it has many unique advantages. Yet it compares in cost to low-priced cleaners now on the market. This means that you can switch to Nordall and get the benefits of many of these advantages — at no extra cost!

Wyandotte Nordall is designed for emulsion cleaning of metal parts in pressure spray washers. It can also be used for immersion or soak type cleaning or for cold cleaning of large metal and concrete equipment. Ask your Wyandotte Representative to demonstrate the advantages listed at right.

P. S.—Do you have a conversion or civilian production cleaning problem of any type? Write Wyandotte for free technical information and service.

NORDALL

- *Gives maximum detergency at low cost*
- *Inhibits rust*
- *Contains special solvents which reduce evaporation losses*
- *Has sustained emulsion life*
- *Is noncorrosive*
- *Does not foam*
- *Is always uniform*
- *Is nonflammable and nontoxic under normal use.*

THE WYANDOTTE LINE— products for burnishing and burring, vat, electro, steam gun, washing machine and emulsion cleaning, paint stripping, acid pickling, related surface treatments and spray-booth compounds. An all-purpose floor absorbent: Zorball. In fact, specialized products for every cleaning need.

WYANDOTTE CHEMICALS CORPORATION
WYANDOTTE, MICHIGAN
Service Representatives in 88 Cities

Wyandotte
REG. U. S. PAT. OFF.

Dissociating Ammonia to Get Hydrogen?

CUT DOWN ON SHUTDOWNS FOR CATALYST CLEANING

use Du Pont "NATIONAL"*

Anhydrous Ammonia

IN CYLINDERS

You can't buy purer ammonia than Du Pont "National" Anhydrous Ammonia in cylinders . . . never less than 99.99% ammonia. It's always uniform, always dependable, always dry—the moisture content less than 50 parts per million. In producing hydrogen you don't have the problem of frequent shutdowns for cleaning your catalyst to remove carbon deposits caused by oil.

And Du Pont "National" goes a long way . . . one 150-lb. cylinder dissociated gives you the equivalent of 25½ cylinders of hydrogen. To serve you quickly, there are distributors and stock points conveniently located across the country. E. I. du Pont de Nemours & Co. (Inc.), Polychemicals Dept., Wilmington 98, Del.

DISTRICT OFFICES:

818 Olive St., St. Louis 1, Mo.; 350 Fifth Avenue, New York 1, N. Y.; 7 S. Dearborn St., Chicago 3, Ill.; 845 E. 60th St., Los Angeles 1, Calif.

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Do you know these other Du Pont chemicals for metal treating?

HYDROXYACETIC ACID 70%

For bright dipping of copper, electro-polishing of stainless steel and electroless plating of nickel.

METHANOL

Source of hydrogen and carbon monoxide for an efficient reducing atmosphere in many metallurgical operations, and for the cleaning of metal parts during fabrication.

For product information on these and other chemicals, please write on your letterhead.

DU PONT
REG. U. S. PAT. OFF.
BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY
Polychemicals
DEPARTMENT
CHEMICALS • PLASTICS

—Defense Contracts—

Contracts Reported Last Week

Carrier, Combat Gas — Harian Stitching Co., Haverhill, Mass.

Carrier, Combat Gas—Hub Hosiery Mills, Lowell, Mass.

Barges—Portland Tug & Barge Co., Portland, Oregon.

Barges, gasoline—E. W. & A. P. Dupont, Inc., Morgan City, La.

Mixer Trucks—Mixermobile Distributers, Portland, Oregon.

Spare parts for Caterpillar Tractor Co.—Caterpillar Tractor Co., Peoria, Ill.

Spare parts—R. G. LeTourneau, Inc., Peoria, Ill.

Spare parts—Fruehauf Trailer Co., Detroit.

Spare parts—Timken Roller Bearing Co., Canton, Ohio.

Compressor parts—York Corporation, Philadelphia.

Turning Machine—Machinery Associates, Philadelphia.

Valve, thermostat control—Lawler Automatic Controls, Inc., Mt. Vernon, N. Y.

Machine, Deburring—Anbaco Corp., Niagara Falls, N. Y.

Taps, screw and bolt—Reiff & Nestor Co., Lykens, Pa.

Telescope, Elbow—C. L. Berger & Sons, Boston.

Squares, machinist's—Tubular Micrometer Co., St. James, Minn.

Machine, Universal grinding—Landis Tool Co., Waynesboro, Pa.

Strip, steel—Sharon Steel Corp., Sharon, Pa.

Air compressor—Joy Mfg. Co., Chicago.

Ball Bearings—New Departure Div., G.M.C., Bristol, Conn.

Generator, Acetylene—The Sight Feed Generator Co., West Alexandria, O.

Adapters—Livingston Machine & Tool Co., Frostburg, Maryland.

Repair parts for Diesel Engines—Hercules Motors Corp., Canton, Ohio.

Repair parts for Diesel Engines—General Metals Corp., San Francisco.

Repair parts for Steam Engines—Vickers, Inc., Waterbury, Conn.

Repair parts for Electric Motors—The Imperial Electric Co., Akron, Ohio.

Repair parts for Electric Motors—Allis Chalmers Mfg. Co., Milwaukee.

Repair parts for Hoisting Equip.—Continental Copper & Steel Industries, Perth Amboy, N. J.

Repair parts for Gasoline Engines—Le Rei Co., Milwaukee.

Repair parts for Diesel Engines—The Cooper-Bessemer Corp., Mt. Vernon, Ohio.

Pump, centrifugal—Leff Engineering Co., Inc., Mobile, Ala.

Repair parts for Hoisting equip.—Chain Belt Co., Milwaukee.

Repair parts for Laundry Equip.—U. S. Hoffman Machy. Corp., New York.

Repair parts for Diesel Engines—The Kerfund Co., Inc., Long Island City, N. Y.

Fuze, Igniter, Fire Bomb—Aerial Products, Inc., Elkton, Maryland.

End-Plate, Front, Assy.—Durabilt Mfg. Co., Aurora, Ill.

Motor Generator and Motor Alternator—The Hobart Bros. Co., Troy, Ohio.

Linkr, metallic belt cal—Spring Div., Borg Warner Corp., Bellewood, Ill.

Carriage Assy.—Rex Machine & Tool Co., Inc., Winchester, Mass.

Tank Automotive Spare Parts — Continental Aviation & Engineering Corp., Detroit.

Metal Parts for Primer—Spring Corp., Adrian, Mich.

Heaters, water—California Steel Products Co., Richmond, Calif.

Machinery & equipment — Briggs Mfg. Co., Detroit.

Needle, suture—O. K. Products Co., Highland Park, N. J.

Tug, harbor—Avondale Marine Ways, Westwego, La.

Barges, gasoline—Albina Engine & Machine Works, Portland, Oregon.

Blowers, ventilating—American Blower Corp., Detroit.

Gun, Auto—Crown Cork & Seal Co., Baltimore

Defense Contracts

Spare parts—Crown Cork & Seal Co., Baltimore.

Fuze, grenade hand—Bayshore Industries, Elkton, Md.

Mt. Telescopes—Safety Car Heating & Lighting Co., New Haven, Conn.

Trainer, radar—Transducer Corp., Boston.

Concrete mixers—The T. L. Smith Co., Milwaukee.

Machinery & Equipment—Frigidaire Div., General Motors Corp., Dayton.

Thermostat Assy.—Airesearch Mfg. Co., Los Angeles.

Spare parts—Engineering & Research Corp., Hyattsville, Md.

Government Inviting Bids

Latest proposed Federal procurements, listed by item, quantity, invitation no. or proposal, and opening date. (Invitations for Bids numbers are followed by "B," requests for proposals or quotations by "Q.")

Nut, jam, regular steel finished, (ENG-23-065-52-233 B), Oct. 22.

Nut, jam, semi-finished, (ENG-23-065-52-233 B), Oct. 22.

Nut, regular, steel, zinc coat, 3000 ea, (ENG-23-065-52-233 B), Oct. 22.

Nut, slotted, steel, black, semi-finished, (ENG-23-065-52-233 B), Oct. 22.

Nut, slotted, steel, (ENG-23-065-52-233 B), Oct. 22.

Nut, wing, steel, (ENG-23-065-52-233 B), Oct. 22.

Hosp. equip. & sup., 3432 ea, 413B, Oct. 24.

Dental items, 33252 ea, 438B, Oct. 24.

Pens, stylographic, various points, 1169 ea, 52-348B, Nov. 6.

Ejector clip, dwg. C-5546018, 81520 ea, 52-60B, Oct. 23.

Spring, hammer, dwg, B-6008887, 76991 ea, 52-60B, Oct. 23.

Spring clip latch dwg, B-6008887, 81520 ea, 52-60B, Oct. 24.

Hydraulic lift parts, materials, 52-102B, Nov. 5.

Unit fuel tank, fuel level sending unit, 4500, 52-434B, Nov. 6.

Kit, maintenance parts, 185 st, Q, Oct. 22.

Meter, test, analyzer, portable, 34 ea, Q, Oct. 22.

Calculator, circular slide rule, 4 ea, Q, Oct. 22.

Outlet, convenience, Hubbell, 476 ea, Q, Oct. 22.

Transformer, United Transformer Corp., 443 ea, Q, Oct. 22.

Set, test lead, 285 st, Q, Oct. 22.

Connector, cube, tap, cord type, 110 ea, Q, Oct. 22.

Set, test lead, 159 st, Q, Oct. 22.

Floodlight, Utility, 253 ea, Q, Oct. 22.

Transformer, adjustable, 82 ea, Q, Oct. 22.

Muzzle brake, per drawing, 3000 to 8000 ea, 29391 Q, Nov. 7.

Hammer, pneumatic, 33 ea, (04-203-52-447), Oct. 23.

Wrench, pneumatic, 14 ea, (04-203-52-447), Oct. 23.

Mower, lawn, power driven, 3 ea, LA-INF-66, Oct. 22.

Vibrators, pneumatic, 2 ea, (ECA-82-740-00-N112-1-2217), Oct. 26.

Vibrators, pneumatic, external, 2 ea, (ECA-82-740-00-N122-1-2217), Oct. 26.

Concrete mixer, 1 ea, (ECA-82-740-00-N122-2217), Oct. 26.

Tractors, 1 ea, (ECA-82-740-00-N122-2217), Oct. 26.

Forceps, 3024 ea, 1-25, Oct. 30.

Forceps Intestinal, 1080 ea, 1-25, Oct. 30.

Laryngoscope adult, 18 ea, 1-25, Oct. 30.

Needle hypodermic, 8064 bx, 1-25, Oct. 30.

Needle, spinal puncture, 912 ea, 1-25, Oct. 30.

Compressor, air, est qua 16 ea, D-31, Oct. 23.

Folding wheel chairs, est qua, H-59, Oct. 30.

Electric shock therapy apparatus, 160 ea, H-53, Oct. 22.

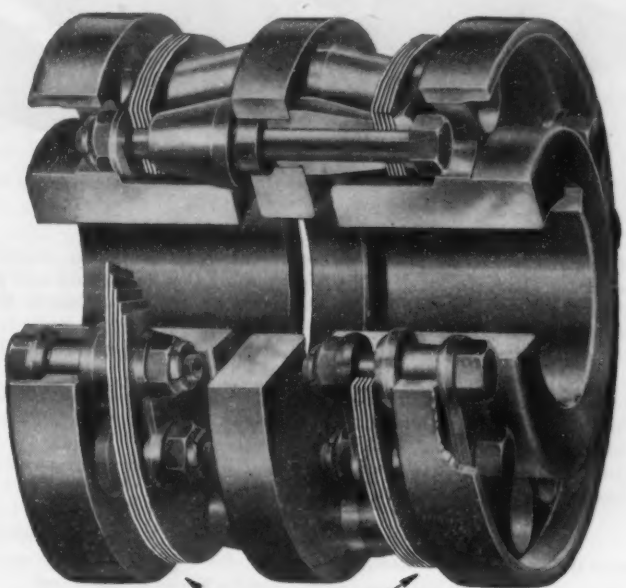
THOMAS *Flexible* ALL METAL COUPLINGS

FOR POWER TRANSMISSION • REQUIRE NO MAINTENANCE

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

Thomas Couplings have a wide range of speeds, horsepower and shaft sizes: ½ to 40,000 HP — 1 to 30,000 RPM.

Specialists on Couplings for more than 30 years



PATENTED FLEXIBLE DISC RINGS

BACKLASH FRICTION WEAR and CROSS-PULL are eliminated

LUBRICATION IS NOT REQUIRED!

THE THOMAS PRINCIPLE GUARANTEES PERFECT BALANCE UNDER ALL CONDITIONS OF MISALIGNMENT.

• • •

NO MAINTENANCE PROBLEMS.

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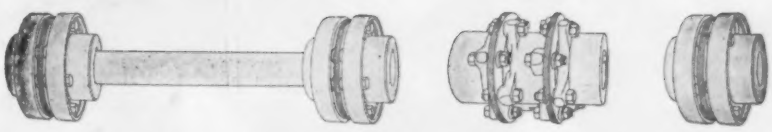

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WARREN, PENNSYLVANIA

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Where slips could spell disaster,

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U·S·S MULTIGRIP FLOOR PLATE is comfortable to walk on, comfortable to work on. And, wet or dry, Multigrip offers skid resistance and positive traction in every direction . . . cuts down on accidents due to slips and falls. The sloping sides of the scientifically-designed risers make it impossible to trip on them. Multigrip is attractive in appearance. Easy to clean. Permanent. *Safe.*

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U·S·S MULTIGRIP FLOOR PLATE 1-1143

UNITED STATES STEEL

—Construction—

Steel Inquiries and Awards

Fabricated Steel inquiries this week include the following:

2214 **Tons,** Lancaster County, Pa., divided highway, 7 I-beam bridges, Pennsylvania Department of Highways, Harrisburg, Pa. Bids to November 2, 1951.

875 **Tons,** Beaver County, Pa., divided highway, 3 girder bridges, 2 I-beam bridges, 1 slab bridge, Pennsylvania Department of Highways, Harrisburg, Pa. Bids to Nov. 2, 1951.

405 **Tons,** Lancaster County, Pa., two I-beam bridges and 1 slab bridge, Pennsylvania Department of Highways, Harrisburg, Pa. Bids to November 2, 1951.

295 **Tons,** Lehigh and Northampton Counties, Pa., repairs to existing bridge, Pennsylvania Department of Highways, Harrisburg, Pa. Bids to November 2, 1951.

Reinforcing Bar Awards this week include the following:

900 **Tons,** Rochester, Minn., Mayo Clinic to Bethlehem Steel Co.

600 **Tons,** Davenport, Ia., Oscar Mayer Packing Co., to Joseph T. Ryerson

320 **Tons,** Tinley Park, Ill., State Hospital to Joseph T. Ryerson & Son.

280 **Tons,** Gary, Taylor Forge Co., to Truscon Steel Co.

226 **Tons,** Hammond, Ind., U. S. Government Tank Farm pump house and boiler station to Bethlehem Steel Co.

190 **Tons,** Toledo, Library and Law School, U. of Toledo, to U. S. Steel Supply Co.

160 **Tons,** Chicago, St. Charles Elementary School to Joseph T. Ryerson & Sons.

105 **Tons,** Downers Grove, Ill., William Dwight Herrick, Jr. High School to Concrete Steel Co.

100 **Tons,** Chicago, St. Charles High School to Joseph T. Ryerson & Sons

Reinforcing Bar Inquiries this week include the following:

1900 **Tons,** Hammond, Ind., Lever Bros.

615 **Tons,** Lancaster County, Pa., divided highway, 7 I-beam bridges, Pennsylvania Department of Highways, Harrisburg, Pa. Bids to November 2, 1951.

600 **Tons,** Keokuk, Ia., Senior High School.

600 **Tons,** Minneapolis, Northern States Power Co.

350 **Tons,** South Bend, Test Cell for Studebaker Corp.

350 **Tons,** Chicago, Jacson-Laramie Apts.

285 **Tons,** Bosford, Rowley, Georgetown and Newbury, Mass.—Limited access state highway (new Newburyport Turnpike to New Hampshire and Maine), bituminous concrete and six bridges. Charles A. Fritz, Beverly, district engineer. Bids due Oct. 30, 1951. Completion date, June 19, 1953.

205 **Tons,** Union Grove, Wis., Employees building.

180 **Tons,** Chicago, Universal Oil Products Co.

100 **Tons,** St. Paul, convent and school, St. Agnes Church.

Curbs Hit Residential Building

Credit curbs and materials control held September construction of residential units to 91,000, and the 9-month total to 852,000, U. S. Bureau of Labor Statistics reports.

Although this is 23 pct under last year, the total has passed the 850,000-unit goal set by the government for the entire year—with 3 months to go.

Right to Pass on Cost Hikes Assured

Calamity predictions don't impress Congress . . . Capehart amendment here to stay . . . Power planners warn of shortage . . . Investigate automotive parts buying—*By G. H. Baker.*

Right or wrong, the inclusion of cost increases in computing manufacturers' selling prices is now assured.

In spite of dire forecasts of "terrible" price rises to come, Congress has flatly refused to strike the so-called Capehart amendment from the control law, thus assuring manufacturers and fabricators of freedom from the cost-price squeezes so common during World War II.

Economic Stabilizer Eric Johnston and Price Boss Mike DiSalle have maintained that "effective price control depends principally upon their ability to force manufacturers to absorb higher costs of labor and materials.

Without this provision, federal price-control machinery is "unworkable," they claim.

No Price Relief—But opponents of forced cost-absorption point out that the government's policy has thus far been marked by a disinclination to grant price relief until manufacturers hit by higher costs are all but forced to close their plants.

Under the Capehart amendment to the Defense Production Act, manufacturers and processors are permitted to pass on to consumers almost all cost increases from the time the Korean war started until last July 26. President Truman criticized this provision as "the terrible Capehart amendment," and called for its immediate repeal.

New Crisis Calls — Government planners of power projects continue to turn up at least one new crisis each week in their campaign for construction of new federal power developments.

Comes now Clifford R. Beardsley, power requirements chief for the Defense Electric Power Administration, who says that not only the Pacific Northwest and the Great Lakes areas are incapable of meeting the power requirements of their areas, but a large part of Texas also is sadly delinquent.

Long-Term Shortage—The rapid load growth has caused addition of a large part of Texas, and a large area around the Great Lakes to the danger list, where power curtailment may have to be made, Beardsley says.

This shortage will continue through all of 1952 and probably into 1953, he predicts. Areas where power is cheap have loaded their power suppliers to the hilt, and the coming curtailment orders will inevitably affect industries, he states.

Renegotiation — Federal procurement experts predict that the U. S. Treasury will be about $1,000,000,000 richer by 1952 as a result of contract renegotiation.

This, it is pointed out, is only a rough guess, since the renegotiation law passed last spring will not begin to operate until next month when corporations file their excess profits returns.

In World War II, however, the excess profits recaptured by the government were turned over to the government departments and agencies for their further use (through revolving funds), but the new renegotiation law requires the return of such funds to the U. S. Treasury.

Why Not the Source?—Question of why the Army is buying its automotive parts from automobile manufacturers, instead of from parts manufacturers is due to be raised on Capitol Hill soon.

A House Executive Expenditures subcommittee headed by Rep. Porter Hardy, D., Va., wants to know the answer. His subcommittee already has been closeted in executive session with both military and industry automotive executives.

Public Hearings — Present schedule calls for a series of public hearings to be held sometime between the adjournment of Congress and the end of the year.

If a majority of the subcommittee has its way, look for army automotive procurement officials to order a switch in their buying policies that will divert a large portion of parts orders.

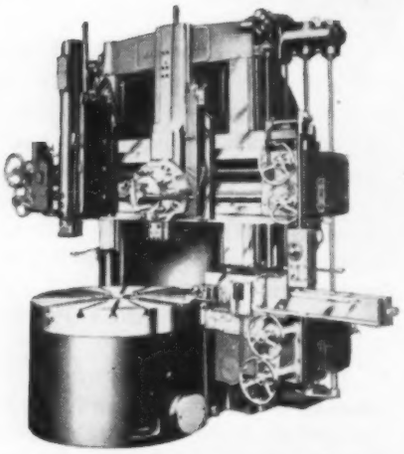
Asks Funds to Halt Mergers

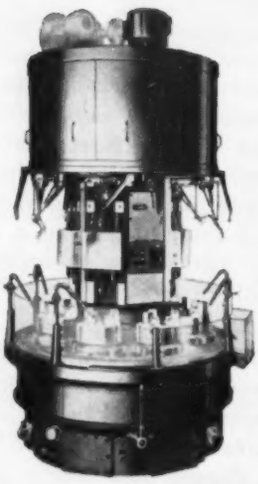
President Truman has asked Congress to appropriate an additional $300,000 to finance the federal government's new authority to block business mergers.

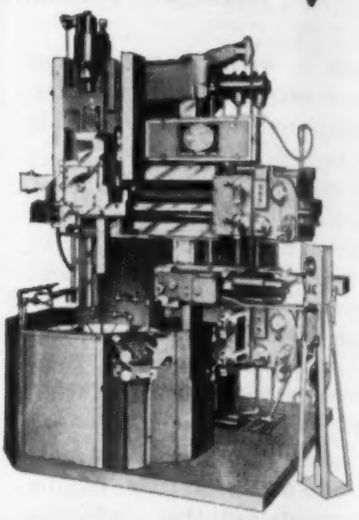
Congress last year amended the Clayton antitrust law to permit the Federal Trade Commission to stop mergers that would tend to result in a lessening of competition in any given trade or industry.

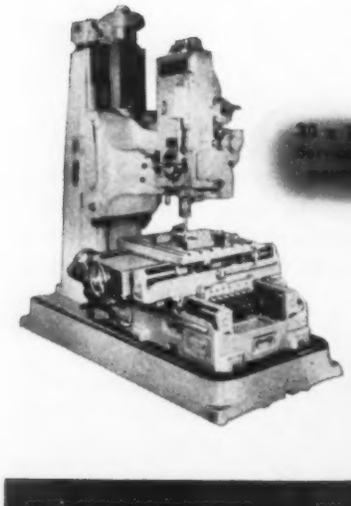
Thus far, Congress has not been disposed to vote the extra expenses requested. Many congressmen take the position that the FTC already is well-supplied with funds for investigations of the type proposed.

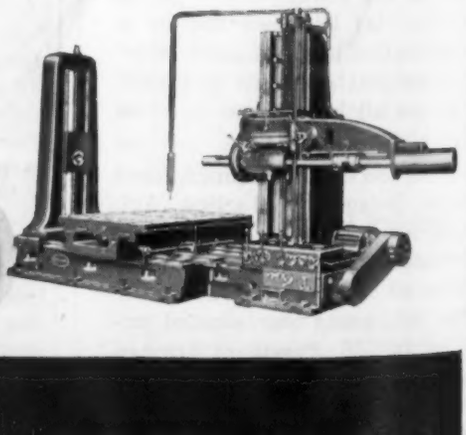
Select BULLARD for Manufacturing Economy











THE BULLARD COMPANY
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WRITEOFFS: Priority System Set

Moratorium ends . . . Screening will be stricter . . . Machine tools top list . . . No new applications to be considered until priority list is taken care of . . . New writeoffs out.

Defense Production Administration has lifted its moratorium on issuance of amortization certificates. It has set up a priority system for processing 8000 pending applications involving $12,000,000,000 proposed for new or expanded facilities. In some fields getting approvals will be more difficult. Screening will be stricter.

At the same time, it is strongly hinted that the new White House dispersal policy will soon begin to affect disposal of the applications.

Machine tools will get top billing under the new priority system.

The nine remaining priority categories will be processed as follows, in order: Ores (mining), pig iron, sulfur, military end items, basic aluminum, nitrogen, aviation gasoline, steel scrap, and special aluminum extrusions.

Priority First—About 5 weeks will be needed to clear up the priority applications. Virtually no new applications will be given consideration until the priority categories are worked out—unless, of course, they also fall within the ten groups.

Officials state this rule will not be strictly applied to any applications for basic steel expansion or atomic energy. None of either are now pending. And, if new ones should come in, they are to be worked into the priority processing.

Issuance of certificates of necessity does not automatically assure allocations of controlled materials or even priority aid, DPA says. In fact, it is unlikely that programs approved now and later will get allocations before second quarter 1952. But provisions will be made for second-quarter allocations and for subsequent periods.

Free from Policy—On applications for tax writeoffs for projects on which construction has already started, DPA chief Manly Fleischmann said not too much weight can be given to "established policies" such as the White House dispersal recommendation or to the availability of manpower.

He warns that for projects on which construction begins after Nov. 1, a "greater control" of proposed expansions may be exercised to "keep them within established goals."

In any event, certificates of necessity for construction which begins on and after Nov. 1 will be issued only after DPA decides "as to the shortage of facilities and essentiality of the product."

Based on its review of the program during the moratorium, DPA will shortly issue a formal order of preference on "essentiality." This will govern order of processing—after the current priority list is worked through.

DEEPER CUTS: This trio was on hand to let the Senate Joint Banking and Currency and Small Business Committees know that civilian output in first quarter 1952 would be "moderately lower". Left to right are NPA's Manly Fleischmann, Munition Board's John D. Small, and Mobilizer Wilson.

New List Out—With lifting of the moratorium, a new list of 456 certificates of necessity was issued. All fall within the exceptions listed when the moratorium began on Aug. 18.

It was reported that 819 applications had been turned down since that date. About 40 have asked for reconsideration.

The new list of approvals brings the total number of certificates issued to roughly 4000. About $10,000,000,000 in new or expanded facilities have been approved.

The rejection rate has run at about 33 pct, the total disapprovals numbering around 2000.

Iron & Steel Dividends Higher

Steel companies paid out 15 pct more in dividends during the first 8 months of 1951 than in 1950, according to U. S. Office of Business Statistics. Publicly-reported dividends of the iron and steel industry amounted to nearly $242,000,000, as against about $210,000,000 last year.

General Growth—Payments were higher for all industries except the food, beverages and tobacco industries. This resulted in raising payments through August to a high of more than $4,300,000,000, as opposed to $3,900,000,000 in 1951.

Dividends for automobile manufacturing firms showed the greatest increase—from $225,000,000 through August last year to $286,000,000 in 1951, an increase rate of 28 pct.

Crude Sulfur Export Quotas Set

Crude sulfur allocations for the fourth quarter made by the International Materials Conference, permit the U. S.—long a sulfur exporter—to use 1,098,500 long tons. For distribution purposes, the U. S. and Canadian allocations are combined.

Industrial Briefs

An All-High—KROPP FORGE CO., Chicago, in the fiscal year ended last July 31 broke all of the 115-year-old company's previous earnings and sales records.

Distributor Named—John Lund, Ltd., Crosshills, England, has appointed STANDARD MACHINE & TOOL CO., LTD., Windsor, Ont., as distributors for "Precimax" Precision Grinding & Boring Machines.

Power Station—Largest, most modern natural gasoline plant in Europe, located at Cortemaggiore, Italy, will be powered by a new station which will install four WORTHINGTON PUMP & MACHINERY CORP.'s engine generator units.

Repair Shop—Work has begun on the construction of a new $5,600,000 main diesel repair shop for UNION PACIFIC RAILROAD, Salt Lake City, Utah. A feature of the shop will be a 250-ton overhead crane capable of lifting Pacific's largest diesel.

Pay Increase—A 4¢ an hr "annual improvement factor" pay increase was approved for employees on the hourly and weekly payrolls of TEXAS ENGINEERING & MFG. CO., INC., Dallas, and its subsidiary, LUSCOMBE AIRPLANE CORP.

Foreign Plant—Ferro Corp.'s eighth foreign plant entered into production at the end of September, with the opening of FERRO ENAMEL DE MEXICO, in Mexico City. The newest Ferro plant, will produce 5 million lb of frit annually.

Plant Dedicated—ROCKWELL MFG. CO., Pittsburgh, makers of Delta power tools and industrial equipment, last week dedicated a new branch plant encompassing 160,000 sq ft at Tupelo, Miss.

Firm Formed — John Mohr & Sons, have announced the incorporation of a subsidiary company, MOHR OPEN HEARTH DIV., INC., to engage in all phases of openhearth engineering and construction.

It's Fantastic — The world's first rocket helicopter, in the class of "fantastic weapons" forecast by President Truman, has been developed by ROTOR-CRAFT CORP., Glendale, Calif. It weighs less than 100 lb, can be parked in a space no larger than the top of an office desk, and is designed to carry one man and special armament.

Merger Proposed—The boards of directors of the E. & G. BROOKE IRON CO. and COLORADO FUEL & IRON CORP. have approved an agreement for the transfer of the assets of Brooke to C. F. & I. The transfer will not take place unless approved by the stockholders of both companies at meetings to be held in the near future.

Moved In — LEPEL HIGH FREQUENCY LABORATORIES have moved into their new modern and spacious building in Woodside, Long Island at 55th St. & 37th Ave., just off Northern Blvd.

BY RADIO: One dispatcher controls 24 vehicles by Motorola FM 2-way radio at Timken Roller Bearing Co.'s Steel and Tube Div. at Canton, Ohio. Included in the fleet are locomotive cranes, jeeps, and fork and straddle trucks. Plant officials report radio controls reduce movement time, improve control, and increase overall operating efficiency.

Titanium Output—Production of titanium metal at the newly constructed Henderson, Nev., plant of TITANIUM METALS CORP. has started. An output of 10 tons per day is the production goal expected to be reached late next year.

Foreign Aid—Part of a $28 million International Bank loan to Yugoslavia is scheduled for use in developing the nonferrous metals extraction industry, coal mining, and electric power distribution.

Scrap Collection — GENERAL MOTORS CORP., Detroit, has collected more than 7000 gross tons of non-production scrap metal. Among the items collected during the campaign was a 95-ton drop forge hammer base from Oldsmobile Div. in Lansing.

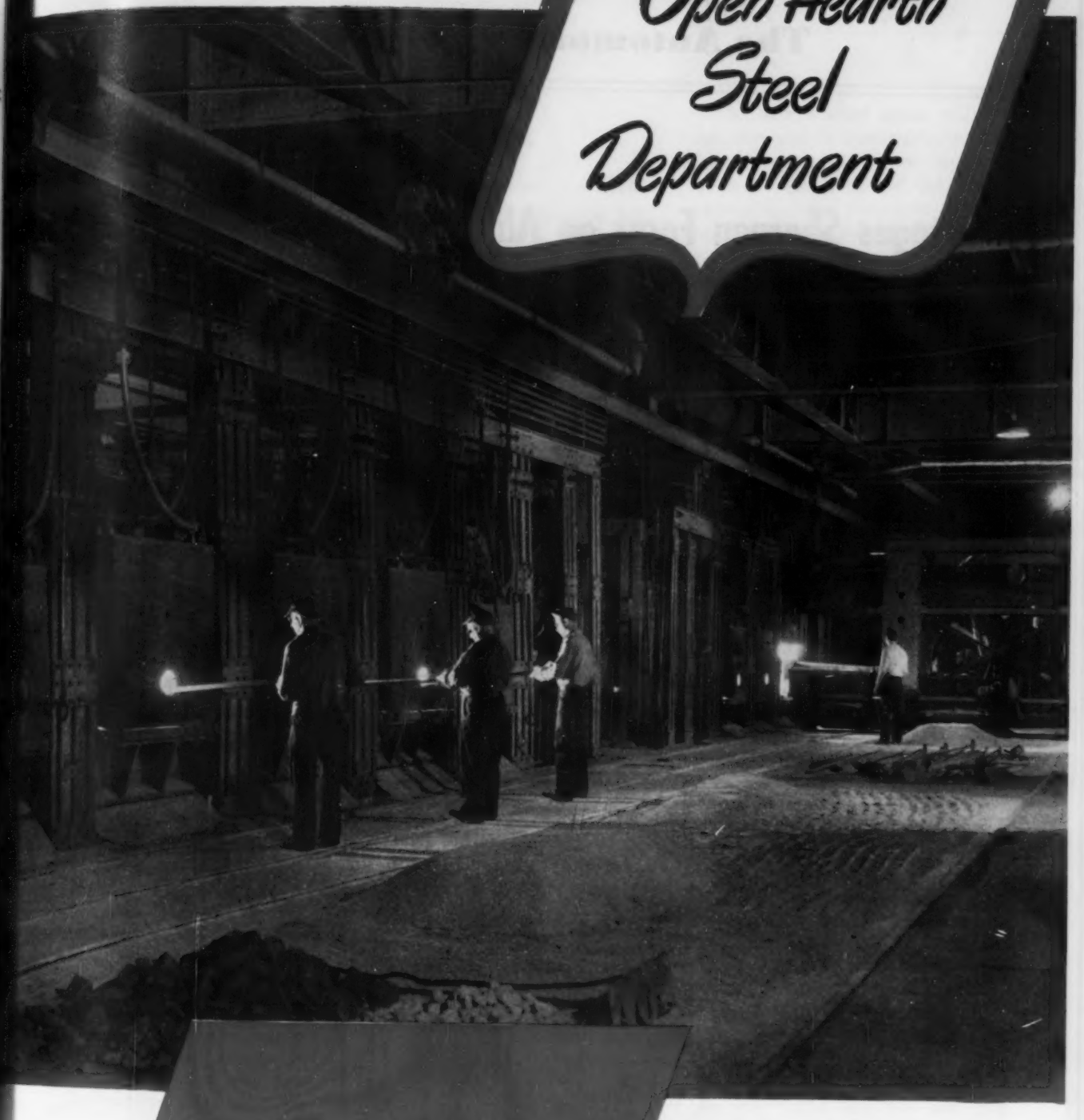
Navy Contract — A several million dollar contract to build four main propulsion turbines for the Navy's new carriers the USS James V. Forrestal has been awarded to the WESTINGHOUSE ELECTRIC CORP. The order was placed by the Newport News Shipbuilding & Drydock Co., builders of the new vessel.

Honor Award—Ernest T. Weir, chairman of NATIONAL STEEL CORP., was presented with the Stevens Honor Award Medallion in recognition of notable achievement in steel production at the annual meeting of the Alumni Assn. of the Stevens Institute of Technology.

Production Increased—A ten-fold increase in production of complete rocket motors for surface-to-surface missiles will be undertaken by RYAN AERONAUTICAL CO., San Diego, as a result of orders just received. Latest contract for missile rocket motors is from Firestone Tire & Rubber Co.

Record Month—Orders for more new locomotives were placed in September this year by the railroads than in any other month on record, the ASSN. OF AMERICAN RAILROADS has announced. In that month, they ordered 459 locomotives, of which 444 were diesel-electric and 15 were steam.

Open Hearth Steel Department



Working a heat of high quality steel in the Mesta Open Hearth Department.

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MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA

Shortages Sharpen Focus on Aluminum

New techniques hint new applications . . . Alcoa shows auto "heavy" on aluminum . . . Weight savings high . . . Brazing may lead to aluminum engine . . . Casting progress—*By W. G. Patton.*

Recent advances in aluminum processing techniques and the threat of a long-term copper shortage have re-focused attention on aluminum as an engineering material

Automotive engineers visiting the Cleveland works of the Aluminum Co. recently were shown a 1948 Pontiac in which many of the components were made of aluminum. An aluminum motor was used. In addition, wheels, radiator, hood, rear deck lid, doors, rear bumper and a small body stamping were made of aluminum.

As a rule of thumb, the use of a pound of aluminum will reduce the weight of a car about an equivalent amount. To put it another way, if aluminum is used to replace 200 lb of steel and cast iron, the weight of the car will be reduced nearly 200 lb.

New Brazing Method—Recent developments in brazing have made it possible to build an all-aluminum V-8 engine using five core-free castings which are assembled by a new brazing technique developed by Alcoa engineers.

The use of aluminum in trucks and buses has already gone forward at a rapid pace. Several hundred pounds of weight are being taken out of the rear axle and differential assemblies and the wheels of large trucks. Many buses use aluminum bumpers.

Precision Casting—In addition, Alcoa engineers have made rapid strides in developing precision casting techniques, using a combination of plaster and permanent molds. This combination gives physical properties not previously attainable. Through the use of permanent molds, high production at low cost is possible. Carefully designed molds and cores permit close control of solidification.

Recent improvements in die casting techniques have brought the cost of die casting into the range of permanent mold costs for a number of applications. The latest improvements in techniques for finishing aluminum are quite satisfactory for most commercial applications.

Engineers studying the problem agree that the role of aluminum in the motor car of tomorrow is certain to be much more important than it is at present.

"Thing's aren't back to that, surely."

Easy Driving—Driving a Chrysler car equipped with power steering is an experience the average motorist is not likely to forget. Ease of slipping in and out of parking places is impressive, although not the most important contribution of Chrysler power steering.

Driving on the highway the motorist observes the absence of wheel fight.

Experience Reassures—At first, the absence of resistance to turning while traveling at fairly high speeds may cause uncertainty in the driver's mind. However, a little experience at the wheel quickly eliminates this sensation.

Power steering is a contribution toward ease and driving comfort that is certain to be appreciated.

Hardtop Popularity—Ability to ease a dollar out of the buyer's pocket has always been an outstanding characteristic of the automobile industry. Statistics recently compiled by Ward's indicate this trend is continuing.

For example, the 2-door sedan is declining sharply as a body style. The 4-door sedan is holding its own. Meanwhile, the hardtop coupe—the most expensive model of all—is jumping in popularity and now accounts for 9.3 pct of all body style production.

Costlier Features—During the first 9 months of 1950, hardtops represented less than 3 pct of total vehicle production. This body style was not available during 1949.

With power steering and booster brakes coming along fast in public acceptance—not to mention high horsepower, high compression engines—the auto industry is apparently losing none of its ability to reach into the consumer's pocket.

Turn Page

STRIKE: Union, B-W in Deadlock

Can't say when serious parts shortage will strike . . . Stocks were good . . . Union won't drop drive for company-wide bargaining . . . B-W holds firm . . . Only two divisions operating.

Automobile manufacturers apparently entered the Borg-Warner strike with better-than-average stocks of parts. Nevertheless, it is impossible to say when a critical shortage will develop and close down at least one of the industry's major assembly lines.

There is no present indication the UAW-CIO is ready to abandon its drive for a master agreement. Similarly, the company is holding fast to its policy of bargaining at the local level.

Only Two Operate — Struck Warner Gear plants supply transmissions, timing chains, sprockets, torque converters, clutches, radiators, universal joints, propeller shafts, automotive stampings, fuel and air pumps, and other automotive parts. The Warner Gear plant at Muncie and the Auburn plant are the only B-W divisions operating at the present time.

Conciliation has already failed to settle the dispute which has been certified to the Wage Stabilization Board. Because the clash involves fundamental issues, most observers feel the strike will be a long one. If prolonged, the effect on automobile production will be disastrous.

Engine Tooling Moves Ahead

If hard work, ingenuity and persuasive talk will keep automobile engine tooling programs rolling, both Buick and Dodge may have new high compression engines in time for their 1953 model introduction.

The issue is not settled but the tooling programs are moving forward despite terrific obstacles. Both companies will have to make many changes in their original tooling if they are to get into production. Pontiac and Packard are also actively interested in tooling for new engines.

X-Ray Tank Steel Sections

Ford's tank division will use a 15 million-volt Betatron x-ray machine to inspect thick steel sections of medium tanks. The new equipment will be installed at the Ford Tank plant now under construction west of Detroit at Livonia, Mich.

The compact magnet assembly for the new Ford x-ray machine was exhibited at the National Metals Congress in Detroit last week. Large steel areas will be encompassed in one exposure. The latest type G-E x-ray machine gathers sensitivity as the thickness of the steel increases. A void only 42-thousandths of an inch in cross section will be seen clearly in metal 14 in. thick.

Nash Offers "Deliveryman"

The Deliveryman, a new commercial utility model, has been added to the Nash Rambler series. The newest body style is designed for business, industrial, retailing and farm usage.

As a commercial car, the Deliveryman is not subject to credit restrictions under Reg. W. Ease of handling in traffic plus excellent operating economy are expected to make the model attractive for many commercial uses. With the tail-gate closed, the Rambler utility model offers 52 cu ft of cargo space.

THE BULL OF THE WOODS — **By J. R. Williams**

SOME DAY I'LL THROTTLE MY BIG TRAP SHUT FOR KEEPS! THEY STOP HERE, AN' ME, TH' WISE GUY, DOES ALL TH' TALKIN', ALL TH' YAPPIN'--BLAH, BLAH--AN' LOOK AT HIM--CALM, COOL SILENT AND LISTENIN'!
YES, YOU GOT TO BE A GOOD LISTENER TO BE LOVED!
AND YOU MAY MAKE IT SOME DAY, HARNEY--BUT ONLY WITH THAT KIND OF A GRIP ON YOURSELF LONG ENOUGH!
10-26
J.R.WILLIAMS
COPR. 1951 BY NEA SERVICE, INC. T. M. REG. U. S. PAT. OFF.
REMORSE

Hydraulic Deep Drawing 50% Faster

at Bridgeport Thermostat, using MULTIPRESS®

In three drawing stages—at speeds up to 1500 per hour—Multipress forms phosphor bronze discs into thin-walled tubes (left) that later become high-precision bellows (right) for thermostatic controls.

A 15-ton Multipress at Bridgeport Thermostat (Division of Robertshaw-Fulton Controls Company) Bridgeport, Connecticut

"Multipress is also 100% better on set-up and maintenance," says press foreman at Bridgeport Thermostat.

Here's more evidence that deep drawing jobs can be done faster, better and cheaper the Multipress way.

The job here is cupping and drawing phosphor bronze discs into long tubes that are later formed into intricate bellows for thermostatic controls.

With easily adjusted stroke of oil-smooth ram action plus controlled speeds and pressures, Multipress makes it possible to finish the job in fewer stages, at speeds up to 1500 draws per hour. This is 30 to 50 per cent faster than the previous mechanical press method, depending on depth of the draw.

The thin-walled tubes have to be accurate in the highest degree, as the complex folding and corrugating operations that follow must produce bellows that are uniformly sensitive to the slightest temperature changes.

Multipress also makes the operators' job easier, safer, quieter, and more pleasant. A slide feed pushes the part into the press die, and ram action is controlled by footpedal.

The Multipress, a 15-ton model, handles the job with three-ton pressure, but is also used at higher tonnages, on steel parts, with different tooling. (The dual push buttons are used on some of these job set-ups, where different safety precautions are required.)

The press foreman at Bridgeport Thermostat reports that Multipress cuts maintenance costs and sharply reduces set-up time—not only for the different draws but also in tooling the press for other operations.

Equally important gains are reported day after day by other Multipress users, on jobs that include blanking, forming, crimping, staking, punching, bending, broaching, assembling, and many others.

Multipress is available in a wide range of sizes, as shown below. Index tables; dial feed tables; harmonic stock feeds; attachments for straightening, pelleting, foil marking; and many other standard Multipress accessories are also available. If desired, Denison can design and build tooling, dies, and fixtures to meet your needs. Write today for complete information.

Multipress is built in 8 frame sizes —one to 50-ton capacities.

The DENISON Engineering Co.
1152 Dublin Road, Columbus 16, Ohio

DENISON HydrOILics

SHIPPING: Dock Strikes Threaten

Steel shipments threatened . . . Complete freight tie-up feared . . . NPA stalls shipbuilding . . . Report on metals expansion . . . Set policy on Geneva Steel changes — *By R. T. Reinhardt.*

Another "control" confronts steel users of the West—waterfront labor strife.

Long slumbering bitterness between AFL and CIO unions over control of West Coast shipping is preventing the unloading of three ships in San Francisco and two at Long Beach operated by the Isthmian Steamship Co. (U. S. Steel Corp. subsidiary). These five vessels carry 1200 tons of steel for West Coast ports—only enough for a sizable building—but ramifications of the situation give cause for concern.

About 17 pct of all steel consumed in the West normally comes here by water. Now, with NPA dictating where and when steel may be used, orders delayed in shipment can be costly.

Could Be Bad—There is a disheartening prospect of smouldering waterfront trouble bursting into flames as it did in 1934 and tying up all incoming shipments. With the West entirely dependent upon the East for several specialties, it seems unlikely that water freight will be specified for some time to come.

Bethlehem Troubles — Suspension of the contract for building five Mariner class ships in San Francisco area by Bethlehem Pacific Coast Steel Corp. has raised eyebrows in the West.

NPA allegedly refuses to allocate sufficient steel for the job. However, this shipbuilding program was planned months ago and was then considered an important, if not vital, part of our defense program. Initial sincerity of the government in finally allocating some new ship construction to the West Coast in spite of higher costs is questioned. Some feel the gesture was purely political.

Bethlehem Prepares — Bethlehem, in good faith, has already spent several hundred thousand dollars in labor procurement, basic engineering and developing subcontractors. Best guess is that the contracts will be reactivated within a few weeks.

Miners Convene—Problems of finding and digging out raw materials were discussed in Los Angeles early this week by about 2000 members of the American Mining Congress.

R. T. Elstad, president, Oliver Iron Mining Co., reported, "$115 million are already committed for development of taconites."

Magnesium Bright — Lawrence Litchfield, Jr., vice-president, Alcoa Mining Co., stated that 52 pct of the planned expansion of the aluminum industry, amounting to 310,000 tons, will use natural gas instead of water power. Eighty-five thousand tons will be produced by lignite.

He added that prospects for magnesium are brighter than for aluminum. Indications are that production of this light metal will be increased eight times when six government-owned plants built during World War II are in full production.

Peace in Utah — Governor J. Bracken Lee of Utah and the Salt Lake City Chamber of Commerce have been assured by top U. S. Steel Corp. officials that no drastic changes in the corporate set-up of Geneva Steel Co. will be made until after consultation with Utah people.

Some changes are expected when Dr. Walther Mathesius retires in the immediate future as president of the steel company.

Utah interests look with disfavor on absorption of Geneva into Columbia Steel Co. For one thing, it would be regarded as an affront to local pride. More important is the feeling that such a deal would work to the disadvantage of Intermountain fabricators when steel is hard to get. Dr. Mathesius has long been regarded by Utahans as a friend in court; without such a friend, these Utah fabricators feel they would be in the hands of "foreigners."

TIMBER!: Dynamite charge topples old blast furnace at Minnequa Works of Colorado Fuel & Iron Corp., Pueblo, Colorado. The furnace was kept in production till the last minute while construction was started on a new one. When the old furnace went down the new one was skidded onto its foundation.

This is another of the "HUNDREDS OF JOBS" which can be done only on a MARVEL Band Saw!

MARVEL BAND SAW saved these two 4400 lb. castings

Two sand cores washed out when these giant 4400 pound steel connecting rods were cast, resulting in solid eye ends without gaps. Then came the $64 question—how to machine out the 1½" slots in the longitudinal center of the eyes which were 22" high and had a wall thickness of 6½".

The Ernest J. Nelson Iron Works of San Francisco did this "impossible" job easily, quickly and economically, without special tooling, on a standard Model #8M/2 MARVEL Band Saw. Two cuts were made in each rod in two hours per cut with tool cost of $3.06 per rod. The tool was a MARVEL B9-10 Band Saw Blade.

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SEND FOR CATALOG 171

Air Force Empties Reserve Tool Sites

Only 5000 machines left of original 30,000 . . . What's left may be scrapped . . . Navy sits on its tool stores . . . Every old tool issued must be replaced by new one—*By G. Elwers.*

Machine tool builders and rebuilders got first crack at the remaining 5000 machine tools in the Air Force reserves last week. For 2 days, the reserves were opened to 150 machine tool builders and 45 rebuilders, to take what they needed from the depots at Marietta, Ga., and Omaha, Neb.

Next week, the remainder of the reserves will be offered to Army and Navy contractors and subcontractors. After they've had their pick, other government departments will be covered to see what they need. Then it is expected that any tools remaining will be scrapped.

Reports say most of the tools now remaining—there were originally some 30,000 in the Air Force reserves—are primarily gear-cutting, grinding, and welders.

Navy Holds Back—The Air Force makes no attempt to see that these tools go only to Air Force contractors. Not so the Navy, which is still sitting on most of its reserve stock of tools. The Navy has a complex industrial mobilization plan set up for activation in case of all-out war.

The tools in its reserves are earmarked for specific uses within this plan. Thus it will not let go of the tools to help break production bottlenecks now, unless the tool is replaced. And the reserves are available only to Navy contractors.

Return the Old—Some of the other holders of machine tool reserves also want tools withdrawn to be replaced. They want a contractor who withdraws a tool to show that he has that tool on order from a machine tool builder. Then, when he gets delivery of the new tool, he is expected to return the old one.

The Navy is tougher. When it allows a tool to be withdrawn from its reserve, the Navy itself orders a new tool to be placed in the reserve in place of the one withdrawn. This puts the already-overloaded machine tool industry in the foolish position of having to build some new tools for storage while contractors must do with old, worn tools.

Win on Standards—A rarity in Washington-industry relations is the victory recently won by the newly-formed National Machinery Rebuilders' Assn.

This group is composed at present mostly of machine tool rebuilders, who have long believed there should be definite standards to which machine tools should be rebuilt.

This group had the pleasant surprise of having its recommendations on such standards adopted almost word for word in the recent OPS ceiling price order for as-is, reconditioned, and rebuilt machine tools.

Broad Membership—The organization plans to admit rebuilders of all types of machinery, such as textile, road construction, and electrical equipment. It intends to affiliate with the American Standards Assn.

It will maintain definite standards as to the quality and quantity of work which must be done before its members can classify a machine tool as reconditioned or rebuilt.

Priority—The tool industry got a small boost when Washington announced it would receive first priority in the granting of certificates of necessity. But another Washington promise—top priority for obtaining of components like bearings and electric controls—has failed to materialize. Actually, builders say, their priority now ranks about third.

Can't Be Done—Without top priority for materials and components, and with little help in solving manpower problems, the machine tool industry doubts if it can meet the optimistic production figures recently quoted by ODM's Clay Bedford. Bedford said machine tool production this year would total $675 million.

Actually, it seems that it can't possibly top $610 million. Likewise, Bedford's estimates of $1.3 billion next year and an annual rate of $2.2 billion by the end of next year seem far out of reach without much more substantial aid from Washington.

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3. Minimizes Warpage

Because it is *stress-relieved*, this superior bar assures the user a minimum of distortion.

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Many companies are realizing important savings by using Ground and Polished STRESSPROOF bars instead of grinding the steel in their own shop. For this superior steel provides precision tolerances at a reasonable cost, without tying up valuable labor and machinery.

This all-purpose bar stock is ground to close tolerance and highly polished at the LaSalle plant on batteries of modern machines — at lower cost than you can grind it yourself. Furthermore, because this versatile steel is stress-relieved, it requires no straightening after keyseating, journaling, threading, or other machining operations. And its four qualities in-the-bar eliminate many other costly operations.

Almost all of today's Ground and Polished STRESSPROOF production is going into defense jobs. However, from time to time, some sizes of sample bars may be available for testing purposes.

LaSalle STEEL CO.

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The Iron Age

SALUTES

Herman D. Moskowitz

Much steel production hinges on the scrap industry . . . His efforts merit him the title Mr. Scrap.

THE scrap industry is a highly individualized group. Everyone thinks—and rightly—he has eaten, slept and toiled scrap all his life. But one man, by his ability and because he has so ably represented the scrap industry in Washington, qualifies for the title of Mr. Scrap.

Herman D. Moskowitz has been in the scrap industry so long he doesn't remember when he wasn't. He has seen the industry come from the horse and buggy days and take its place beside other groups responsible for industrial expansion in the United States—and now for global defense against communism.

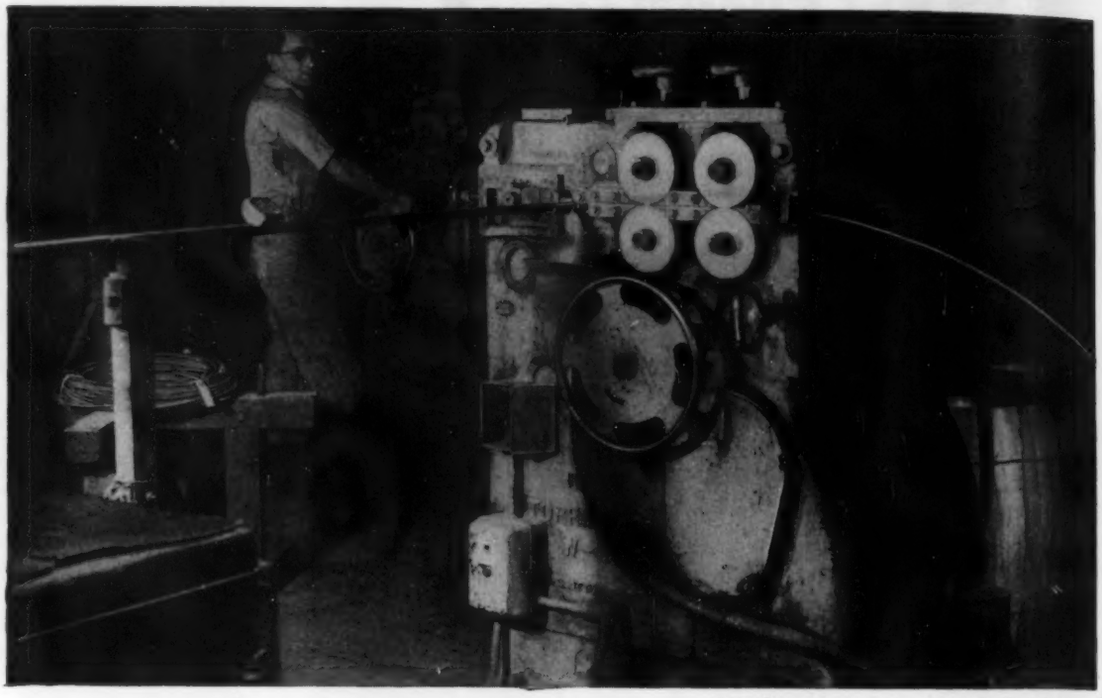
Herman was knee deep in scrap problems during World War II as a scrap man and as adviser to government agencies. He is back again today in the same fight giving his time, his experience and his enthusiasm.

His job is much tougher today. Steel production hinges in large part on scrap collections. He and the scrap industry will need a mild winter to avert a scrap crisis. He keeps one ear tuned to weather reports.

Mr. Scrap is respected on both sides of the fence. He was several times president of the Institute of Scrap Iron & Steel. He is a practical man who helps set policy for scrap collection drives.

This is what you would expect from a man who at 16 was a scrap buyer, and a few years later a contact man between mills and dealers. Since 1929 he has been vice-president of Schiavone-Bonomo, Inc.

HIGH CARBON WIRE



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The Iron Age

INTRODUCES

. A. Joslyn, named director of chases at the COOLERATOR CO., nth.

. T. Kinnison, appointed assistant chasing agent for JAS. P. MARSH P., Skokie, Ill.

lare E. Briggs, promoted to gen- sales manager of the PACKARD TOR CAR CO., Detroit. **Thomas** Boyd, joined the company's public tions department as editor of *ard News.*

ames F. Murray, elected a director the RIGIDIZED METALS CORP., Yalo.

avid J. Gemmell, appointed assis- t to the president of HODELL AIN CO., Cleveland, division of National Screw & Mfg. Co.

hil Hill, appointed district mana- of HYSTER CO. in the Philadel- a-Baltimore territory.

ohn J. Peterson, named Eastern manager of TRAILMOBILE, C., with headquarters in New York.

). V. Perry, named assistant sales nager, spray painting and finishing sion, DEVILBISS CO. Toledo. R. Gracely has been promoted to post of Eastern district manager, offices in Newark.

Walter W. Urmetz, Jr., named a representative, Cleveland dis- t office of ALLIS-CHALMERS G. CO. W. F. **Vander Mass** has n named manager of the Grand ids district office, general ma- nery division, succeeding **George C.** ver, a veteran of more than 40 rs of service, who has asked to be ieved of his managerial duties. Mr. ver remains as a company repre- tative in the Grand Rapids area.

Frank P. Regan, named president of TRIMONT MFG. CO., Roxbury, Mass., a division of Aetna Industrial Corp. Mr. Regan succeeds **A. E. Keating** who has resigned.

R. F. Schutz, named assistant treasurer of the Ingersoll Products Div. of BORG-WARNER CORP., Chicago.

A. Lyson, returned to his position as sales manager of T.A.B. ENGINEERS, INC., Chicago.

Archie K. Beard, appointed Midwest sales manager of TURCO PRODUCTS, INC. **Harold P. Glavin** has been named to the post of general manager, Midwest division factory, with headquarters in Rockdale, Ill.

Samuel P. Owen, appointed advertising manager of the ROCKWELL TOOLS, INC., Columbus, Ohio.

Victor G. Muzzu'in, appointed plant engineer of NILES-BEMENT-POND CO., West Hartford, Conn.

James A. Moody, appointed material control manager and **William O. Hall** to chief project and test engineer at C. A. NORGREN CO., Denver.

Louis Lippa, elected treasurer and vice-chairman of the board of directors of APEX SMELTING CO., Chicago. **Robert K. Beck** assumes the office of general manager of all operations; **Fritz Nussbaum,** manager of raw material purchases for all plants; **A. J. Peterson,** vice-president in charge of sales and advertising; **D. L. Palmer,** assistant vice-president and Cleveland works manager.

J. H. Wolcott, joined the home office staff of REED-PRENTICE CORP., Worcester.

Turn Page

OWEN R. RICE, named vice-president and manager, Freyn Engineering Department, Engineering & Construction Div., Koppers Co., Pittsburgh.

JAMES F. THOMAS, named plant manager of the new Duncansville, Pa. sheet metal fabrication plant of National Radiator Co.

HAROLD W. SCHWENGEL, named vice-president in charge of sales for Modern Equipment Co., Port Washington, Wis.

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Personnel

Continued

Leo Haggerty, appointed assistant sales manager, Detroit Div., SOLAR STEEL CORP. and **Harry D. McQuown** was appointed assistant sales manager of the Cleveland Div. **Louis C. Rudel** was named assistant sales manager, bar and tube division.

John A. Hoholik, promoted to superintendent of the axle plant, BUICK MOTOR DIV., Flint, succeeding **James A. O'Neil** who has retired.

L. R. Ludwig, appointed director of engineering and research, Atomic Power Div., WESTINGHOUSE ELECTRIC CORP., Pittsburgh.

Don Heator, named district television manager for WESTINGHOUSE ELECTRIC CORP.'s home radio division, Detroit. **P. R. Heitmeyer,** appointed Detroit consumer product manager; **Alfred Burke,** consumer product sales promotion manager; **G. R. Filson,** district appliance specialties manager; **E. V. O'Hara,** district radio-television sales manager; **Alfred Brown,** Toledo consumer product manager.

Tom E. Hughes, named assistant general manager and **Roger D. Williams** became general sales manager, Cleveland diesel engine division of GENERAL MOTORS CORP.

Robert G. Gerstmyer, joined the DEARBORN CHEMICAL CO.'s sales staff, and will cover North and South Carolina with headquarters in Charlotte, N. C.

J. B. Laramy, appointed manager, marketing research department of WORTHINGTON PUMP & MACHINERY CORP., Harrison, N. J.

C. W. Moss, appointed director of market research and analysis for KAISER-FRAZER CORP., Willow Run, Mich., succeeding **J. L. Friedman** who has assumed new duties as contract consultant in the company's defense manufacturing program.

Erling Wessel, elected a member of the board of directors of HUBBARD & CO., Pittsburgh.

Wilford H. Magee, appointed district manager of the Houston office of EARLE M. JORGENSEN CO. **James R. Tams** appointed assistant district manager. **Lester B. Tolson** was named assistant district manager of the Dallas warehouse.

JAMES R. MORAN, appointed director of industrial and labor relations of the Ingalls Iron Works Co., Birmingham, and its subsidiaries.

RUSSELL P. SHERRILL, joined the Bridgeport Chain & Mfg. Co. as New England district sales manager.

JAMES W. MURRAY, promoted to general sales manager for Fabricators Steel & Mfg. Corp., New York.

WILLIAM IRRGANG, elected executive vice-president of the Lincoln Electric Co., Cleveland.

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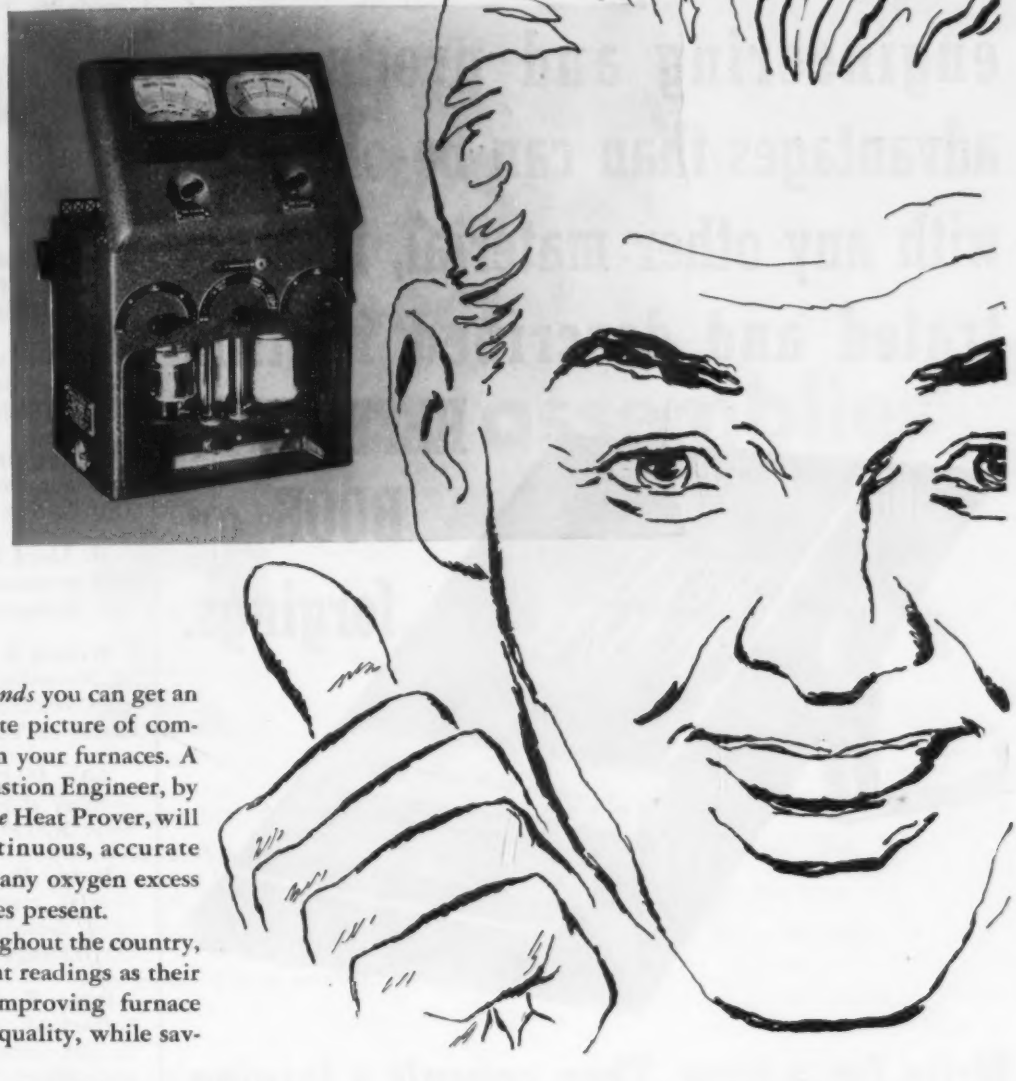

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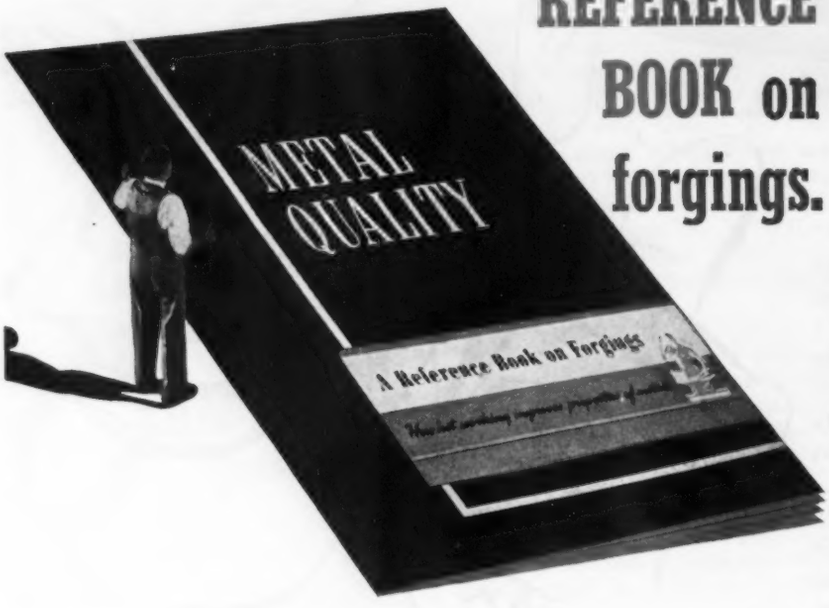

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Name.....
Position.....
Company.....
Address.....

—Personnel—

Continued

John J. Powers, Jr., elected a v... president of CHARLES PFIZER ... CO., Brooklyn. Robert C. Porter ... ceeds Mr. Powers as secretary of ... company.

J. C. Schwingle, appointed direc... of purchases and **Charles J. Petty** ... purchasing agent for the ING... SHIPBUILDING CORP., Pascagou... Miss. **Donald L. Musselman** has b... named assistant purchasing agent.

H. J. Mokate, resigned as gene... manager of sales of the DUM... STEEL CORP., Pittsburgh.

Dr. Martin G. Vorhaus, appoin... general medical director of the DOU... LER-JARVIS CORP., New York.

George Hamill, Jr., appointed as... manager of the MAGNA-CRES... CORP., New York.

H. Lloyd Beyer, Jr., elected ass... tant treasurer of EDGCOMB STEE... CO., Philadelphia.

William R. Chandler, appointed, ... of November 5th, sales engineer ... the Cleveland territory and sales offi... of the EATON MFG. CO.

John F. Carroll, promoted to th... position of manager of product plan... ning, HOTPOINT, INC., Chicago.

Henry P. Graef, appointed com... mercial research manager, genera... sales department of U. S. STEEL ... CO., Chicago.

Peter T. Hopper and **James H... Sutherland,** promoted to Pittsburgh ... district manager and field engineer, ... respectively, for SKF INDUSTRIES ... INC.

Courtland W. Schefer, named man... ager, Philadelphia office and ware... house, of A. MILNE & CO.

Stanley Dero, promoted to general ... foreman of Lukenweld Machine Shop ... of LUKENS STEEL CO., Coates... ville, Pa.

Charles E. Reardon, named vice... president of the WIRE CORP., Wor... cester.

Paul A. O'Neill, appointed St. Louis ... sales representative for HERCULES ... POWDER CO.'s Naval Stores Depart... ment, replacing **Joseph M. Carbonara,** ... who has been transferred to the ex... port department in Wilmington, Del., ... to handle the sales of products in ... Cuba, Venezuela, Mexico and Co... lombia.

The Iron Age
FOUNDED 1855
Technical Articles

ORDNANCE using X RAYS to inspect complex assemblies

By George Elwers
Machinery Editor

Complex assemblies can be inspected without disassembly by means of 22 million-volt X-rays. Hours of time and labor are saved. The betatron has long been in use for inspection of thick castings and forgings. This new use for its powerful X-rays has been pioneered by Ordnance Corps arsenals.

Large savings in labor, time and dollars are being made by inspection of internal parts of assemblies without taking them apart. Typical is work at the Army Ordnance Corps' Rock Island Arsenal, where artillery recoil mechanisms are inspected to determine if repairs are needed. A procedure requiring only a few minutes replaces hours of labor required to disassemble the mechanisms, and reassemble them after inspection.

Such inspection is done by means of X-rays, and results are recorded permanently on radiographs. Ordinary X-rays couldn't do the trick. But powerful betatrons are used, capable of producing X-rays of great penetrating power, and with special characteristics which make detailed radiographs of complex assemblies possible.

The betatron is in effect a junior cousin of the big atom smashers. Like them, it is a particle accelerator. In the betatron, it is electrons which are accelerated. In industrial applications the electron beam impinges on a platinum target. The collision generates X-rays with energies as high as 22 million electron volts. This compares with the 1-million and 2-million volt conventional X-ray equipment which until recently has been the most powerful available.

Rock Island has the first betatron ever installed for industrial use. This arsenal, besides being a manufacturing center, is also a storage depot. It receives hundreds of artillery recoil mechanisms for storage. Some of these come in from the field with inadequate or no service records. With their previous history unknown or incomplete, these have to be dismantled to

BETATRON as installed at Picatinny Arsenal, looking down from above concrete shield. Ring is part of conveyor system which carries shells past betatron when it is used for continuous inspection. Out of picture at right is concrete-walled room to hold larger specimens.

determine whether or not they need repair. No operating test could satisfactorily indicate their condition.

If a unit, after disassembly and inspection, was found not to need repair, it would have to be assembled again before storage. The time and labor spent on it would be wasted. On one type of mechanism the cost of disassembly, inspection and assembly is estimated at $300 per unit, not an amount to be needlessly thrown away. Many mechanisms are more complex and the cost is higher.

An example is the hydro-pneumatic recoil mechanism for field guns. In its cylinder is a floating piston assembly, separating the oil and air sides. This assembly consists primarily of a two-piece piston with packing rings on each piece, and a grease-filled space between them. Spring pressure tends to push the piston assemblies together, providing a positive pressure on the grease to prevent leakage from one side to the other.

Grease space indicates wear

As the mechanism is used, the packings become worn, and grease is slowly forced out of the grease space. The distance between the two assemblies, indicating the amount of grease which has been forced out, is an accurate indication of the amount of use and wear the mechanism has had and thus of whether or not rebuilding, or at least repacking, is necessary.

This inspection can be made via a radiograph requiring approximately a 1-min exposure with the betatron. Internal parts of the mechanism are clearly revealed in good detail. The size of the grease space can be measured on the radiograph. In addition, mechanical defects such as broken springs and loose nuts can be detected by examination of the radiograph. Units which do not require repair can be sent directly to storage, their inspection having required only a few minutes' work instead of many hours.

Heart of the betatron is a donut-shaped tube about 18 in. in diameter. This is located between the poles of a powerful electromagnet. The field strength of this magnet varies sinusoidally. Electrons are injected into the tube, and under the influence of the field they make several hundred thousand revolutions around in the tube in a fraction of a second. Having been thus accelerated to near the speed of light, they are deflected by a magnetic impulse so that they strike a tiny platinum target in the tube, producing X-rays. These have the same energy they would have had if they had been produced by a conventional X-ray tube operating, if it were possible, at 22 million volts.

The X-rays thus produced are similar to those from lower voltage equipment, but because of their high energy they have different effects as they pass through material than do lower energy X-rays. Just as in the atomic bomb, where neutrons will cause fission or not depending on their kinetic energy, so the energy of X-rays affects their interaction with atoms in the material through which they pass, influencing their suitability for radiography.

Maximum penetration in 20-25 mev range

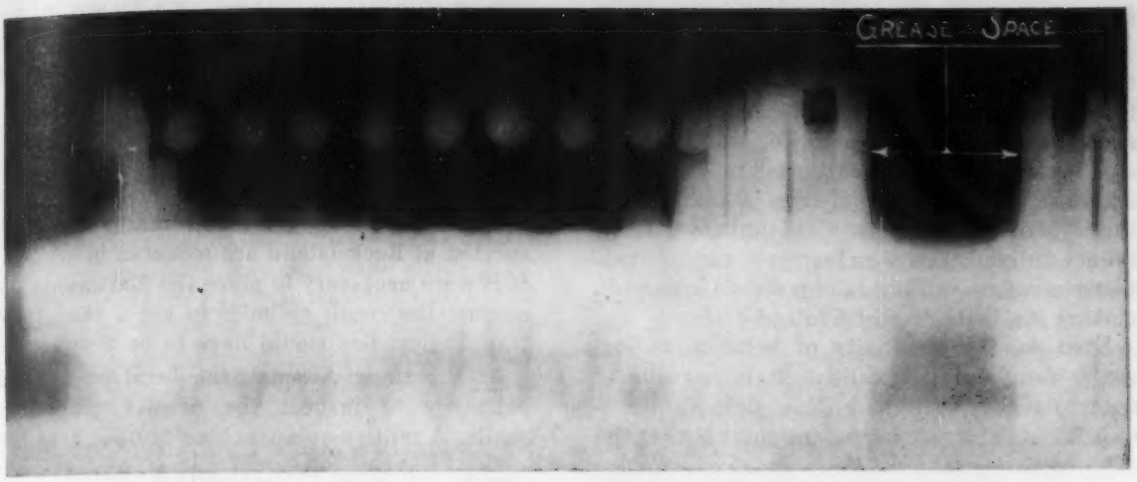
For one thing, the absorption characteristics of iron for X-rays are such that maximum penetration is achieved in the range around 20 to 25 mev. Secondly, the secondary emissions produced by collisions of the X-rays with atoms proceed ahead pretty much in the same direction as the X-rays which produced them, instead of scattering widely as do the secondary emissions of lower voltage X-rays. In addition to these effects of high energy and short wavelength, other beneficial characteristics result from the fact that betatron X-rays emanate from what is practically a point source—a platinum target with an area of only 0.00005 sq in.

To the radiographer, these effects mean fog-free radiographs, shorter exposure time, ability to penetrate thicknesses impossible for X-rays

EXPOSURE TIMES FOR STEEL

Steel Thickness, In.	500 Mg Radium	200 kv X-rays	1000 kv X-rays	2000 kv X-rays	23,000 kv X-rays (400 r/min)
2	5 hr	20 min	30 sec	4 sec	2 sec
4	24 hr	10 days	7 min	23 sec	4¼ sec
6	5 days	.....	1.7 hr	2.3 min	13¼ sec
8	.....	.....	24 hr	15 min	40 sec
12	.....	.....	.....	10 hr	5 5 min

Target to-Film distance—48 in. Lead screens
Eastman Type A film Film density—1.5



BETATRON radiograph of a floating piston assembly in a 155-mm gun recoil mechanism. The grease space opening in this case is normal, indicating that the mechanism does not need repair. Smaller space would indicate that mechanism had worn enough so repairs would be needed.

of lower voltage, greater latitude, and ability to place the film casette at a distance behind the subject.

The time required for exposure with a betatron increases exponentially with thickness, so that radiography of extremely thick sections becomes impractical. However, considerable radiography with betatrons has been done through steels as thick as 20 to 24 in. An exposure through 20 in. of steel can be made in 20 min with high speed film. In contrast, the practical limit of thickness for radiography with 1 million volt X-rays is about 5 in.

This can mean very short exposures for betatron radiography of ordinary subjects. The accompanying table gives comparative exposure times for radium, conventional X-ray equipment of various voltages, and betatron X-rays. These betatron speeds permit production-line inspection of sections of moderate thickness. For instance, specimens 4 in. thick can be inspected at a rate of 12 per min, and specimens 6 in. thick inspected at a rate of 4 per min. Other filters permit even higher rates if flaws are larger. With such high speeds available, specimens as long as 10 to 20 ft can be inspected by lining the entire length with film and then scanning from end to end by rotating the betatron or conveying the specimen past the fixed beam.

RADIOGRAPH of a .45 cal pistol demonstrates the wealth of detail obtainable with betatron radiographs. The original radiograph was taken with the film casette about 6 ft behind the gun, so that magnification was about 2x. The radiographs for this article were taken at Rock Island Arsenal laboratory.

It might be assumed that X-rays of lower energy could penetrate relatively high thicknesses the same as 22 mev X-rays do, through the use of longer exposures. This is not the case, however. The longer the exposure with conventional X-rays, the greater the effect of the scattered secondary emissions on the film. When exposures get too long, the film is fogged and detail obscured enough to make the radiograph useless. But 22 mev betatron X-rays, emanating from a point source and causing only forward scattering secondary emissions, give sharp detail and little or no fogging, even through thick subjects requiring very long exposures.

Beam is relatively narrow

The beam of X-rays from a betatron is a relatively narrow cone. It decreases to half intensity in a cone width of about 8°, but with slight loss of intensity can be made uniform, if desired, over a cone angle of 15° by means of a compensating filter. Even without the filter a standard 14x17-in. film can be adequately filled if placed as close as 6 ft from the betatron. This is due to the great latitude of the 22 mev X-rays.

The 22-mev X-rays permit radiographing objects with considerable section thickness variation in a single exposure. Section thickness differences can be as much as 6 in. With conventional X-rays, separate exposures must be taken to prevent over-exposure of thin sec-

tions or under-exposure of thick ones. Or, filling out thin sections to the equivalent of the thick ones, with barium paste, lead shot, or similar material, must be resorted to. This characteristic of the 22-mev X-rays is called "latitude." It is in a sense a disadvantage since it reduces slightly, on a radiograph, the contrast between a flaw and the solid material around it, making it a little more difficult to detect.

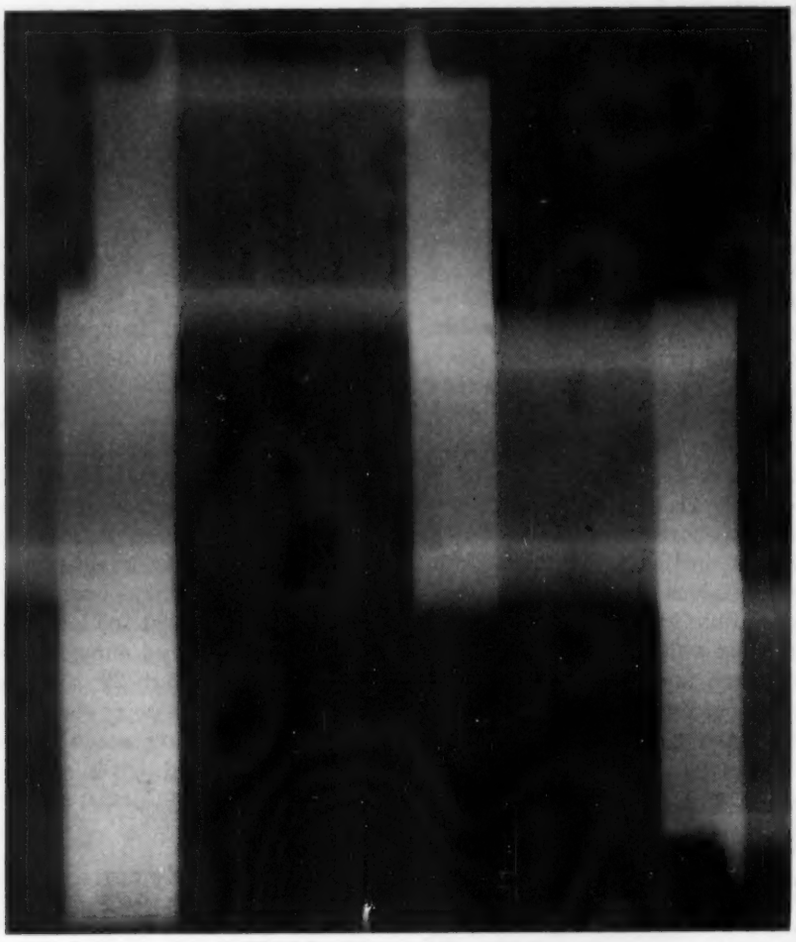
Even so, the sensitivity of betatron radiography for flaws is excellent. It is possible to detect flaws as small as 1/32 in. deep and 0.005 to 0.002 in. wide. An important point is that the minimum size flaw can be detected through steel of any thickness up to 12 in. With lower voltage X-rays the minimum size of flaw which can be detected increases as the section thickness increases.

The minimum width of discontinuity which can be detected is normally given as 0.005 in. However, with magnification this is cut to 0.002 in. Magnification, not possible with conventional X-ray equipment due to scattered secondary emissions, is obtained by placing the film casette at a distance behind the object being radiographed. Magnification up to 3x has been obtained this way.

Aside from magnification, the convenience of being able to place the film casette at a distance back of the subject is important. For example, some of the recoil mechanisms inspected at Rock Island are mounted in cradles. If it were necessary to place the film casette up against the recoil cylinder to get a sharp picture, the cradles would have to be dismantled.

At Picatinny Arsenal, the betatron is used primarily to inspect the powder charge in shells. A million-volt machine is used here for inspection of smaller shells, but the betatron is required for shells larger than 240 mm. The main purpose of the inspection is to look for cavities in the charge, which could cause irregular and even dangerous performance. Obviously, this can only be done by "looking through" the shells after they have been filled with explosive.

Betatron inspection of shells also shows whether or not the fuses have been properly



CRANKSHAFT radiograph, shown in part, clearly shows oil holes, though the steel is several inches thick. Flaws, if any, would have shown up on original radiograph.

assembled, or have become accidentally armed. Jet-assisted-takeoff rockets are also sometimes inspected for cracks or fissures in the powder charge, which could cause improper performance.

Rock Island Arsenal has, when time was available, done betatron radiography for industrial firms. Among such work done has been the inspection for flaws of large diesel crankshafts, whose main journals were about 8 in. in diam. Another example was the use of the betatron to locate the blowholes which were causing unbalance in an 8½ in. thick cast iron flywheel rim.

Early use of the betatron was confined to steel, and to relatively thick sections. It was believed that the instrument could not be used where radiographic densities were low due to thinness of section or low density of the material. However, techniques have been developed for use of the betatron for radiography of sections as thin as ½ in., and permitting radiography of aluminum with a sensitivity actually greater than that for steel. Bronze and brass have also been inspected with betatron X-rays.

Where density of materials is great, as in the high temperature superalloys used in jet engines and rockets, betatron inspection shows great promise. Only relatively thin sections of such materials can be inspected, with long exposures, by other radiographic means.

A betatron is not an inexpensive instrument. The cost of any high-voltage X-ray installation may run to a minimum of about $150,000. The betatron costs roughly 50 pct more than a 1 million volt machine, and 10 pct more than a 2 million volt unit. In addition, it requires added concrete shielding costing about 15 to 20 pct more than for 1 or 2 million volt units.

Of course, this expense can be justified where radiographic inspection is necessary or desirable and thicknesses are so great lower voltage X-rays will not serve. In other cases, the quantity of material to be inspected will often justify the additional cost for a betatron because inspection can be done so much faster. The other advantages of the betatron also contribute to making the additional cost worth while. Besides the uses at Picatinny and Rock Island Arsenals and Atomic Energy Commission and Navy installations, betatrons are in use by private industry for inspection of forgings and castings—several, for example, being used for inspection of cast tank armor.

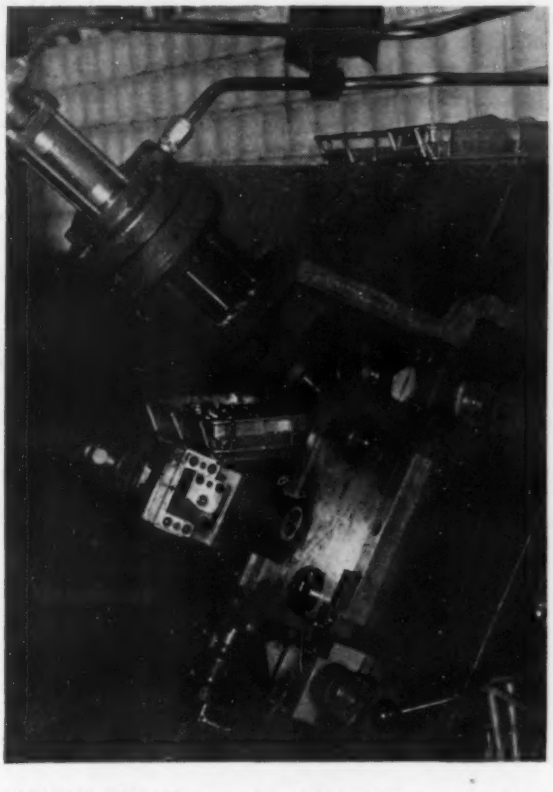
Assembly fixture saves seven operations

An unusual fixture is being used to assemble seven components of the Ford automatic transmission in one operation at Warner Gear Div., Borg-Warner Corp., Muncie, Ind. The entire operation, including loading of the parts, is completed in 45 sec. Both air and hydraulic power are used in this initial assembly operation.

Designed and built by Midwest Hydro-Pierce, Inc., the assembly fixture replaces a less accurate hand operation which required nearly twice as much time. In the earlier method, an air press was used to insert the dip stick hole bushing. Other components were driven home by a hammer.

The new method saves seven operations. The fixture holds parts accurately in position in the loading device. A turn of a lever causes each part to be driven by hydraulic means into its proper location. Simultaneously, the dip stick bushing is inserted in the transmission case. The position of the bushing is periodically checked with a flush pin gage.

The complete cycle of operations is: Load six dowels and dip stick bushing; locate casing in position; clamp casing, using hand-operated air valve; push down hydraulic valve lever to insert dowels and dip stick bushing; raise lever to return units to position, ready for loading; release clamps; remove part from fixture.



UNUSUAL FIXTURE using air and hydraulic power assembles seven components of Ford automatic transmission in one operation. Operation, including loading, takes 45 sec.

Foreign metallurgists add zest to METAL CONGRESS

PACED by the largest number of exhibitors in the 33 years of Annual Metal Show history, over 40,000 engineers and scientists swarmed into Detroit last week. The first World Metallurgical Congress attended by conferees of 27 free nations set a new high standard for round table technical discussion. Chartered buses shuttled between the downtown hotel headquarters of the four technical societies and the National Metal Exposition 8 miles away at the Fair Grounds, the day-round, all week, on 15-min departure schedules.

Technical discussions on every possible phase of metals and metalworking took place at the society headquarters downtown and at the Fair Grounds where 440 exhibitors welded, melted, cleaned, plated, machined and sold their heads off. The regular annual features of the Congress were almost crowded out by some of the new innovations inspired through the large and very enthusiastic participation by leading metallurgists of the rest of the free nations.

Educational lectures, awards, banquets plus long-haired dissertations and down-to-earth practical lectures and lobby seminars produced plenty of variety. Notable in the special features was the Edward De Mille Campbell Memorial Lecture, given by C. H. Lorig, Asst. Director, Battelle Memorial Institute, before ASM, and the Adams Lecture by John J. Chyle, Chief Metallurgist, A. O. Smith Corp., given before AWS. Mr. Lorig's subject was "A Metallurgist Looks at Fracture," while Mr. Chyle spoke on "The Welding of Copper by the Inert-Gas Metal-Arc Process."

Three awards given

G. A. Price, president, Westinghouse Electric Corp., received the ASM "Medal for the Advancement of Research." P. D. Merica, executive vice-president, International Nickel Co., was the 1951 recipient of ASM's Gold Medal Award. Mr. Merica received the award at the Annual ASM Banquet at the Statler Hotel, Thursday evening. The Albert Sauveur Achievement Award was presented to R. A. Mehl, head, Department of Metallurgy, Carnegie Institute of Technology, by ASM. The Sauveur Award is given in recognition of outstanding metallurgical achievements in promoting organized research.

Installation of new officers, contests for the best metallographic exhibits, college alumni luncheons, breakfasts, dinners and ladies' teas filled in, between the main events.

Raw materials situation discussed

Despite the elaborate and brilliant technical programs of ASM, AWS and the Institute of Metals Div. of AIME, the Society of Non-Destructive Testing drew plenty of attention at their 11th Annual Meeting held concurrently with the rest of the show. Their two main events, Symposium on Ordnance Material Testing and Jet Engine Parts Inspection, attracted many visitors from the other societies plus most of the Armed Services officers who attended the Show.

One of the most interesting sessions early in the week was "World Metal Resources" presided over by Zay Jeffries, Director of the 1st World Metallurgical Congress. J. A. Boyd, administrator of defense minerals, and Clyde Williams, Director, Battelle Memorial Institute, brought raw materials and metals for defense of the free world up to date in a most complete and precise fashion.

Pierre Van der Rest, General Manager, Belgian Blast Furnace and Steelworks Assn., made a noteworthy contribution with his paper, "Metals for Defense in the ECA Countries." "Defense Metal Conservation and Substitution," as pioneered so expertly in Germany, was added by K. P. Harter, executive secretary of Vereins Deutsche-Eisenhuttenleute (the German Iron and Steel Institute).

C. H. Lorig of Battelle, in giving the Campbell Lecture, chose to consider some of the fracture phenomena in metals. His remarks were particularly concerned with the designer who needs to be able to predict fracturing or brittleness.

Mr. Lorig stated that such behavior depends on a variety of factors—properties, structural features, crack origin and propagation, to name

a few. Also, even when ordinary mechanical property figures do not show it, an alloy may have more than one fracture strength. Flow in one metal constituent may affect flow in others, setting up interactions that change the stress system.

The premise of absolute homogeneity and isotropy on which all current fracture behavior is based is contrary to known facts. These theories must be broadened to include a reasonable explanation of all facts a metallurgist observes when he looks at fractures.

Technical sessions of ASM were held at the Hotel Statler. Most of the early papers given on Sunday involved the complex subject of "Metal Interfaces." The seminar included theoretical considerations of interfacial energies and movements. On the whole the papers were interesting but were somewhat over the heads of many metallurgists who attended.

Monday morning's session on Melting and Refining came back down to earth with 5 papers, all by foreign experts. A. Scortecci and M. Scortecci, Finsider Metallurgical Institute, Genoa, Italy, proposed "A New Process for Direct Reduction of Iron Pyrites." The process was interesting but the American operators termed the process too messy to consider as an American practice.

Live steam blast used in Bessemer

A much more practical process was discussed by P. Coleur, Director, Centre National de Recherches Metallurgigues, Liege, Belgium, in his paper, "Basic Bessemer Steel—Low in Nitrogen and Phosphorus." Extremely low nitrogen equal to openhearth steels have been produced in basic Bessemer using an oxygen-enriched, live-steam blast. This process can convert iron to steel at a rate of 2 net tons per min. C. H. Herty, Bethlehem Steel Co., and A. B. Wilder, U. S. Steel Co., were co-chairmen of this meeting.

High-temperature problems received considerable study, starting with the session on high temperature phases, held on Tuesday morning. Sigma phase formation in straight-chromium steels, nickel-chromium and chromium, nickel-molybdenum, titanium stainless grades were covered. "Electrolytic Etching" was the subject of a paper by J. J. Gilman, Crucible Steel Co., Harrison, N. J. Coloration of the sigma phase by special etching solutions was presented. The use of cadmium and lead-acetate solutions colors carbides more rapidly than sigma phase, revealing the microstructure in vivid colors.

Sigma phase cracks may be used in etch film

Mr. Gilman showed that the characteristic cracks in sigma phase of stainless steels may actually be in the etch film, rather than a crack in the underlying sigma phase itself.

"High-Temperature Alloys" was another session which was well attended at Building M, at the Fair Grounds. "Cast Heat-Resistant Alloys, 21-pct Cr, 9-pct Ni Type" was the first paper in this panel. It was prepared by H. S. Avery, C. R. Wilke and J. A. Fellows, American Brake Shoe Co., Mahwah, N. J. The above alloy, known as "HF-type," shows superior ductility, equivalent creep strength and as good oxidation resistance up to 1600°F as that of a cast 26-pct Cr, 12-pct Ni steel known as the "HH-type."

The 21-pct Cr, 9-pct Ni austenitic steel is an appropriate alloy for higher alloyed grades such as 26-12 and 16-pct Cr, 35-pct Ni. The 21-9 shows no carbide embrittlement like the 26-12 type and will do the job at intermediate temperatures as well as the 16-35 grade.

At the same session, co-chaired by F. B. Foley, International Nickel Co., and Russell Franks, Union Carbide and Carbon Corp., the creep and rupture strength of 16-25-6 alloy was discussed by C. L. Clark and Martin Fleischman, Timken Roller Bearing Co., Canton, Ohio. While solution

NEW OFFICERS of the American Society for Metals, left to right: President John Chipman, Massachusetts Institute of Technology; Vice-President R. L. Wilson, Timken Roller Bearing Co.; Treasurer R. L. Dowdell, University of Minnesota.

quenching and hot-cold working followed by tempering produced different properties in the alloy at room temperature, the two heat treatments had little effect on creep strength.

The heat treatments show pronounced differences on rupture strength, however. The hot-cold worked alloy was stronger at 1200°F while the solution-quenched samples were stronger at 1400°F.

Clad molybdenum was covered in a paper by W. L. Bruckant and R. I. Jaffee, Battelle Memorial Institute, Columbus, Ohio. Nickel-clad molybdenum is a practical method of protecting the high-temperature alloy under oxidizing conditions. Tests on molybdenum show that this metal is stronger than any other wrought structural metal between 1800° and 2000°F.

Nickel bonded to molybdenum best

To overcome the metal's poor oxidation resistance other materials were tried but none bonded to the molybdenum as well as pure nickel. Molybdenum disilicide coatings are better for long periods of exposure to extreme temperatures but such coatings are brittle and have limited applications. The authors claim that the same disadvantages with ceramic coatings of oxides, silicides and phosphates were found. Joining the edge protection of nickel-clad molybdenum for elevated temperature service has been found to be commercially feasible.

An aluminum alloy for elevated temperature service also received attention. Although the 6-pct magnesium aluminum alloys have poor creep resistance at 600°F, their strength is much improved by adding 0.25 pct Cr and 0.10 pct Ti. This alloy has low density and good resistance to corrosion under ordinary conditions, Messrs. K. Grube, Battelle Memorial Institute, and L. W. Eastwood of Kaiser Aluminum and Chemical Corp. reported in their paper, "Aluminum-6 pct Magnesium Wrought Alloys for Elevated-Temperature Service."

Several discussions on titanium

Titanium was subject to consideration by three of the societies in separate sessions. Spot welding of titanium was covered in an AWS meeting; oxidation of titanium was presented in an Institute of Metals, AIME session and phase diagrams of titanium were discussed in an ASM and an AIME meeting.

The phase diagram of the titanium-silicon system was presented by M. Hanson, H. D. Kessler and D. J. McPherson, Armour Research Foundation, Illinois Institute of Technology, Chicago. This paper given before ASM described the special techniques for preparation and heat treatment of the highly reactive titanium-silicon alloy. The phase diagram shown was constructed using the metallography of cast and heat-treated specimens, X-ray defraction detection of melting

MEDAL WINNER G. A. Price, Westinghouse Electric Corp., who was given the 1951 ASM Medal for the Advancement of Research at this year's Detroit meeting.

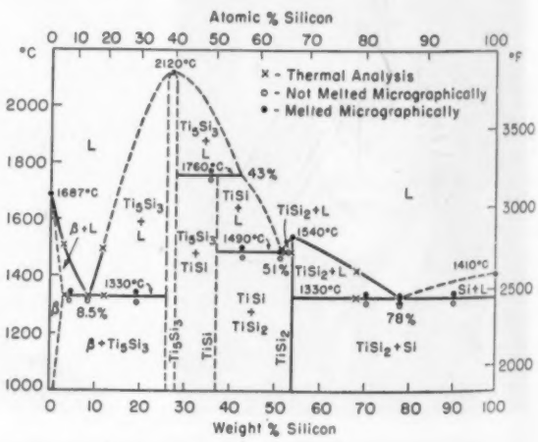
and thermal analysis as principal tools. Titanium-silicon alloys up to 6 pct silicon were successfully hot worked. Alloys containing over 6-7 pct silicon up to pure silicon are hard and brittle.

Meetings, lectures and discussions of the American Welding Society centered around the Book-Cadillac Hotel. Lasting throughout the week, papers were read describing the successful use of welding on new metals such as titanium and old ones such as copper. Other material presented covered a broad variety of techniques and alloys, many already applied to industrial practice.

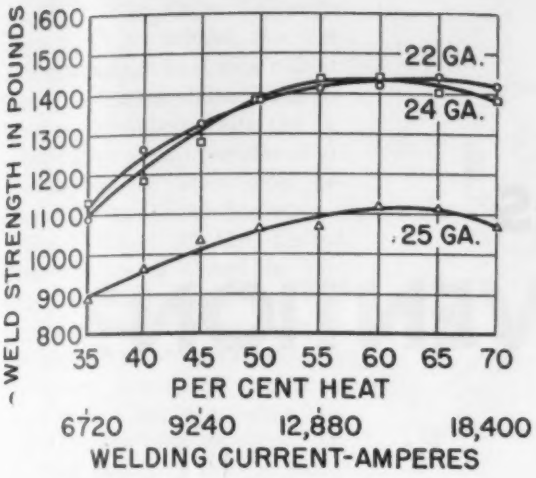
New officers of the society are: President, C. H. Jennings, Westinghouse Research Laboratories; first vice-president, F. L. Plummer, Hammond Iron Works; second vice-president, E. R. Seabloom, Crane Co.

A principal feature of the AWS technical program was the Adams Lecture, given this year by John J. Chyle, chief metallurgist, A. O. Smith Corp. Subject of this paper was "The Welding of Copper by the Inert-Gas Metal-Arc Process."

Copper alloys have long been successfully welded. Commercial grades have been joined by the use of filler metals, although mechanical and physical properties and corrosion resistance of



PHASE DIAGRAM of the titanium-silicon system.



INFLUENCE OF WELD current on strength of titanium spotwelds. Reason for approximately equal strengths shown for 24 gage and 22 gage is that the test materials came from different heats with different ultimate strengths—probably due to varying oxygen and nitrogen contents.

the weld metal are adversely affected. Use of deoxidized copper has generally been suggested because of the difficulties presented by tough pitch copper.

Mr. Chyle limited his discussion to the nonconsumable metal-arc process, although the consumable technique is also applicable. Torches used are water-cooled, have tungsten electrodes and are available in a variety of capacities, up to 800 amp. Results obtained with helium were far superior to argon. While grooves had to be modified somewhat, horizontal and vertical weld positions gave as good joints as those made while flat.

For single pass welds, no peening is required, but multiple layers are improved and fissuring eliminated by this method. Tests showed that high quality welds can be produced by the proposed method having mechanical properties similar to the parent metal.

The AWS discussions on inert-arc welding were started by Paul Klain, of Dow Chemical Co. The paper reported on the application of the new inert gas-shielded, metal-arc process to the welding of magnesium.

Both the globular and spray type of metal transfer produced good welds. Temperature at which the method of metal transfer changed was so high for the smallest diameter wire used (1/16 in.) that all position welding was difficult. However, with a smaller wire and spray-type deposition this difficulty might well be overcome.

Magnesium thicknesses from ⅛ in. to the heaviest available can be satisfactorily welded by the new method. All types of joints can be made but best results were obtained with fillet welds.

Chief advantage seems to be the high welding speeds—in excess of 24 ipm.—but some flexibility and all-around usefulness is lacking as compared to other techniques. The inert gas-shielded, metal-arc welding of magnesium should be useful in large-scale, high-speed jobs.

The first paper in the resistance welding session of the AWS covered experiments in spotwelding commercially pure titanium. The paper was by M. L. Begeman, F. W. McBee, Jr., and J. C. Fontana, of the University of Texas.

An Acme 75-kva spotwelder using 220-v, 60-cycle, single-phase alternating current was used. Cold rolled sheets, 22-gage, 24-gage and 25-gage, were sheared into test specimens 2-¾ x ¾ in. and degreased in carbon tetrachloride. These sheets (as annealed) had an ultimate strength of 70-80,000 psi; yield, 45-55,000 psi; elongation, 12 pct; 175 VHN.

Strength increased up to 13,000 amp

A lap of ¾ in. was used and in the long series of welds, intermediate spots were made on ¾ in. strip stock. For the regular test specimens, it was found that strength increased as weld current was increased up to about 12-13,000 amp. It remained fairly constant up to 18,000 amp, where strength became erratic and fell off.

For optimum results, 12,880 amp seemed best for 22-gage and 24-gage sheet and 10,860 amp for 25-gage. These points are at or near maximum strength, but well below flash point.

Indentation for all three thicknesses was about 20 pct with optimum conditions. This is high and can be reduced by using flatter tips with controlled contact area. All welds were free from porosity and appeared to have a good structure.

The best weld time for the three materials was also selected: 10 cycles for 22-gage, 6 cycles for 24-gage and 6 cycles for 25-gage. Due to limited materials, tip pressure was varied on only two thicknesses, 22-gage and 25-gage. A pressure of 600 lb was found to give the best results. Tip deformation was not excessive.

Micrographs of the welds made in the tests showed a structure similar to that in spotwelded steel. In fact, metallurgical characteristics of the welds were generally good and in line with those of commonly used metals.

BRITTLE BEHAVIOR of metals was the topic of C. H. Lorig, Battelle Memorial Institute, who gave the 26th Edward DeMille Campbell Lecture.

Who owns THAT INVENTION?

by Albert Woodruff Gray
Jackson Heights, N. Y.

The employer has a right to an employee's invention only by previous agreement. Ownership of an invention developed and perfected on an employer's time and with the employer's materials and facilities, may be subject to a "shop right." This is a nonexclusive right to use the invention. But a person employed to invent has no rights in his brainchild.

An employer does not own the invention of an employee except by agreement with the inventor. Even though conceived and perfected on time for which the employee was paid, and developed with the facilities of the employer and the aid of co-workers, the invention belongs to the employee. But here the employer has a shop right, a nonexclusive, irrevocable license to use the invention.

A recent Federal Court decision held a leading aircraft manufacturer liable for infringement of patents granted a former employee.

The employee had agreed he would disclose "all inventions made, developed, perfected, devised or conceived" during his employment. But a provision stated that if the company failed to prosecute a patent application on such an invention within 9 months, the right to the patent reverted to the employee. The company would then retain, under the agreement, a shop right in the invention.

Under the agreement, the employee submitted a memorandum of the details of this particular invention. The memorandum was returned with a penciled note, "Not Interested."

"That notation," the Court said, "like the 'damned spot' in Macbeth, will not out. It spells rejection of the invention which later the company used and which they would now appropriate under the claim of 'shop right.'"

The employer had by this "Not interested" memorandum rejected not only any claim to the invention but to this shop right as well, to which it would otherwise have been entitled under the law.

An employee of the United States Bureau of Standards shortly after World War I was assigned to radio research in connection with aircraft equipment. While engaged in this research he undertook on his own account, but on government time, an investigation into the possibilities of using ordinary house lighting current for radio operation.

This idea was developed into a practical invention and a patent application filed by the

employee. The Federal Government sued to compel the employee to assign to it this patent. The Government claimed the invention, developed while the inventor was a paid employee of the Bureau of Standards, belonged to the United States.

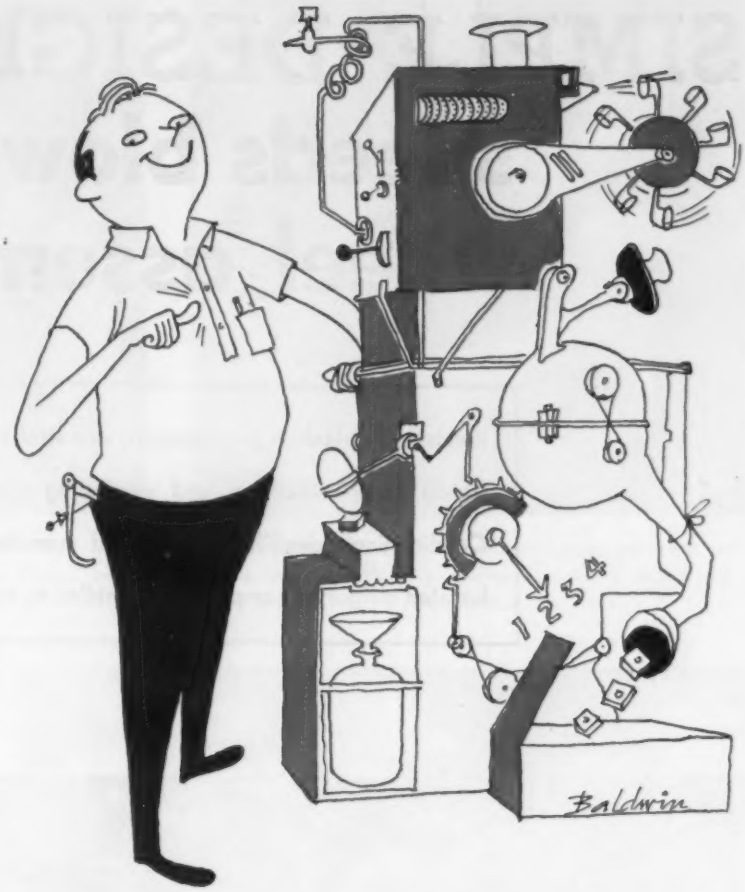
The decision of the United States Supreme Court in this case summarizes the law governing the rights of an employer in the inventions of employees. It limits the extent of the shop right of the employer when the invention has been developed on the time and with the facilities of the employer.

If a person is employed to make an invention, and succeeds, he is bound by law and his employment contract to assign to his employer any patent on the invention. He has produced what he was employed to produce. The invention was the subject of the employment contract. "What he is paid to produce belongs to his paymaster."

If the employment is general, although in the same field of research in which he obtains a patent, the patent under all ordinary circumstances belongs to the employee.

If a corporation employs a skilled workman to make improvements in articles it manufactures, said the Court, it is not entitled to a conveyance of patents obtained by the employee if no agreement to that effect exists.

This ownership of the inventor under such circumstances is, however, subject to a "shop right." Where an employee, during working hours and using an employer's materials and appliances, conceives, perfects, and patents an invention, he must grant his employer a nonexclusive right to use the invention.



THAT INVENTION! Is it yours? Maybe Yes, maybe No.

Since the employee uses his employer's time, facilities and materials, the employer may use that which embodies his own property and to duplicate it as often as he may find occasion to employ similar appliances in his business. But the employer in such a case cannot demand a conveyance of the invention.

References

Garbell v. Consolidated Vultee Aircraft Corp., 94 F.S. 843.
United States v. Dubilier Condenser Corp., 289 U.S. 178.
Solomons v. United States, 137 U. S. 342.
Montsanto Chemical Works v. Jaeger, 31 Fed. 2d 188.
Marshall v. Colgate-Palmolive-Peet Co. 175 Fed. 2d 215.
Grip Nut Co. v. Sharp, 150 Fed. 2d 192

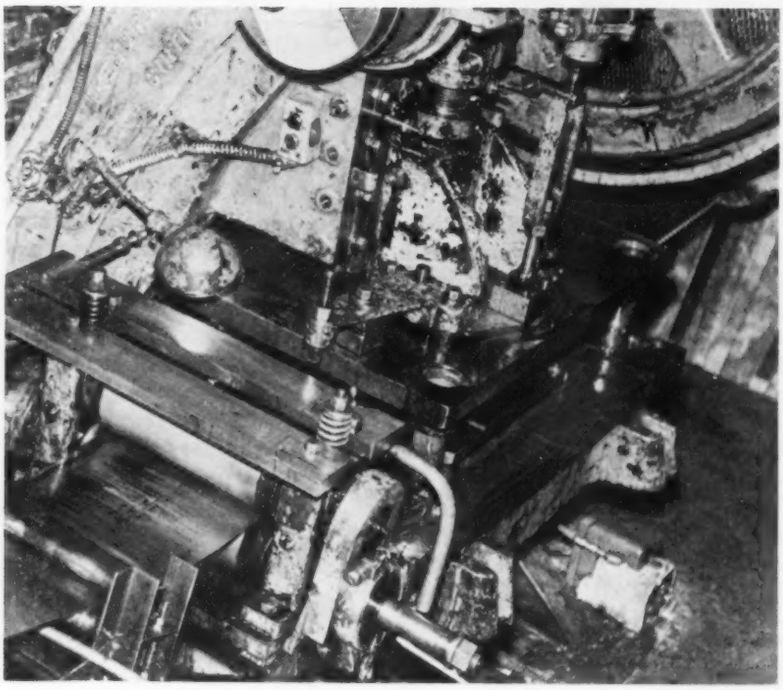
NEW BOOKS

Co-operation In Industry. Cooperation between public authorities and employers' and workers' organizations is the subject of this study by the International Labor Office. Systems of cooperation have broadened awareness by all parties of the importance of productivity as a necessary condition of any rise in standard of living. Cooperation at industry and government levels in several countries were studied for this report. International Labor Office, 1825 Jefferson Place, N. W., Washington 6, D. C. $1.50. 238 p.

1951 Scrap Institute Yearbook. The twelfth in the series of yearbooks published by the Institute of Scrap Iron & Steel again bulwarks with statistics the enormous work of the scrap industry in supplying metallics for the steel industry. The annual survey of operations shows purchased scrap in 1950 reached 29,402,000 tons, a new all-time high. Data on scrap production, consumption, prices, and specifications, make this a valuable reference book. Institute of Scrap Iron & Steel, Inc., 1729 H St., N. W., Washington 6, D. C. $1.00. 110 p.

SIMPLE DESIGN speeds blower wheel assembly

Precision fabrication and assembly are vital in production of blower wheels used in heating and ventilating applications. Viking Air Conditioning's simplified design and manufacturing methods have boosted output of completed assemblies to more than 500 per day.



PROGRESSIVE DIES automatically cut, shape and pitch blower blade from 18-gage coil strip.

Simple design and assembly methods have given Viking Air Conditioning Corp. of Cleveland high efficiency in production of blower wheels. The plant is geared to turn out 500 completed assemblies daily with workers who interchange various assembly operations.

The wheels, used in heating and air conditioning installations, contain only five parts—a single blade section, two end rings and two steel hubs. The blade section is made from 18-gage steel strip. The coil feeds automatically into a progressive die set up in an 88-ton Robinson press. The air-operated clutch on a Littell roll feed is actuated by a micro-switch hit by a cam on the press brake drum. Press-work is accurate within 0.002 to 0.003 in.

As they come from the press, the blades have heavily corrugated edges. These and overall length of the blank are sized by hand on a sizing table. The blade is then curled up and the ends tacked together with spotwelds.

Blades and end rings are assembled in a

BLANKED BLADE must fit slots in lineup table. Part can be lengthened slightly with few taps of hammer. Ends of blade are then tack-welded into wheel shape.

WHEEL IS PASSED to spotwelder. Fan sucks out fumes and sparks, improves efficiency. Clamped in heavy, steel holder, wheel is welded about every inch of the rings.

RINGS ARE PIERCED, left, for paint drainage. Blade, right, is clamped in jig for fitting end ring.

fixture. The jig holds the blade tight while an end ring is fitted to the blade. With the end ring in place in the jig, it is tapped with a hammer for a tight fit.

The wheel then moves on to final spot welding. Inserted in a heavy steel fixture, it is spot-welded about every inch of the circumference. The wheel is practically indestructible under normal usage.

From the spotwelder the wheels roll along a grooved table to a static balancer. Spring clips, some as light as 10 grains, are used as weights. After balancing, wheels are checked for alignment.

Wheels are dipped in a tough, durable baking enamel. Paint in the dip tank is air agitated. End rings, punched prior to assembly, allow proper paint drainage. A conveyor carries the assembly through an infra-red oven.

Blower wheel shafts are milled two at a time. An air-hydraulic clamping fixture with 2000 lb pressure is used. A 4-in. air booster feeds the two 2-in. hydraulic cylinders. After milling, shafts are deburred and ground.

HOUSING AND WHEEL meet. Shaft is spring loaded with wheel in housing. Assembly goes to inspection.

Paint is removed from blower wheel hubs in a reaming operation and the parts move to final assembly. At assembly the shaft is spring loaded with the wheel in the blower housing. Set screws are tightened and the entire assembly moves on to inspection for a final check on alignment, balance and overall assembly.

How to get the most from your lathes

Grinding and marking attachments, sub-headstocks, honing and superfinishing devices, constant surface speed equipment

By John E. Hyler
John E. Hyler & Associates
Peoria, Ill.

No. 4 of a series

Proper attachments can fit an engine lathe to do external and internal grinding operations, honing and superfinishing. Roll marking can also be done on a lathe. Special accessories provide constant surface speed for facing operations, and low spindle speeds for chasing very coarse leads.

Recent years have seen development of a large number of hand and portable grinders. Many such tools are applicable to the lathe toolpost, provided a suitable adapter can be arranged. This embodies a shank that can be held in the standard toolpost like the shank of a cutting tool, and some kind of clamping device that will securely hold the grinder.

Any ingenious mechanic, lacking such an adapter for a small portable grinder, can likely make one. However, manufacturers of small hand and portable grinders have designed and produced toolpost adapters for them. Such small grinders have their chief application to delicate and internal grinding. Some of them are electric-motor driven, while others are powered by compressed air.

Some of these tools used mounted wheels. Various other tools are also available for use with them, some of which have lathe application. Small burrs or steel cutters of different types can be applied. Various small-diameter saw blades for use on wood, plastic, or light metals are used. These saw blades range from a maximum of 2 in. to a minimum of ¼ in. diam. Various mandrels suited to their use are available. Small buffs, polishing wheels, and tips are employed, as well as various small wire brushes with maximum diameter of 2 in.

PORTABLE air-powered grinder fitted with toolpost adapter in use grinding bevel chucked in lathe.

Some very high speed grinders of the general type described have been highly developed. One of these is used for grinding, micro-finishing and polishing. It has also proven suitable for very light milling operations, using midget milling cutters of high speed steel or tungsten carbide. These can be used on glass, or on any metal including hardest alloy steels. Much fine work can be performed with them at the lathe, either with the workpiece revolving in a chuck, in a collet or between centers; or on indexing setups where the workpiece is at rest while the cutter is in action. These little grinder-millers, applicable to the lathe toolpost, have ¼ hp motors and run at speeds ranging from 20,000 to 45,000 rpm.

One can finish-grind holes in hardened steels to tenths with some of the grinders available, which are applied to lathes as well as other machine tools. One air-driven grinder has its speed controllable through a range from 30,000 to 65,000 rpm. Very small diameters of holes can be internally ground with such high available speeds. Very small holes requiring finish grinding are sometimes processed in the lathe using a slender diamond-charged mandrel in the grinder.

Portable grinders of the air turbine type are used considerably in delicate lathe grinding, especially in hole grinding, where extra fine finish or close tolerances are required. Many prefer finish grinding holes to finish boring. Holes can be accurately ground to size after material has been hardened. The precision finish obtained and removal of the carburized surface pays off especially well on dies and die parts.

One air-turbine-driven grinder has been designed especially for grinding holes. It has a tapered shank which can be mounted in the standard lathe tailstock. A feature in its design is an offset adjustment. The grinding tool proper, which carries the small grinding wheel, has a sturdy wide male dovetail machined across its end at 90° with the tool axis. This fits into and is adjustable within a female dovetail in the shank portion of the tool.

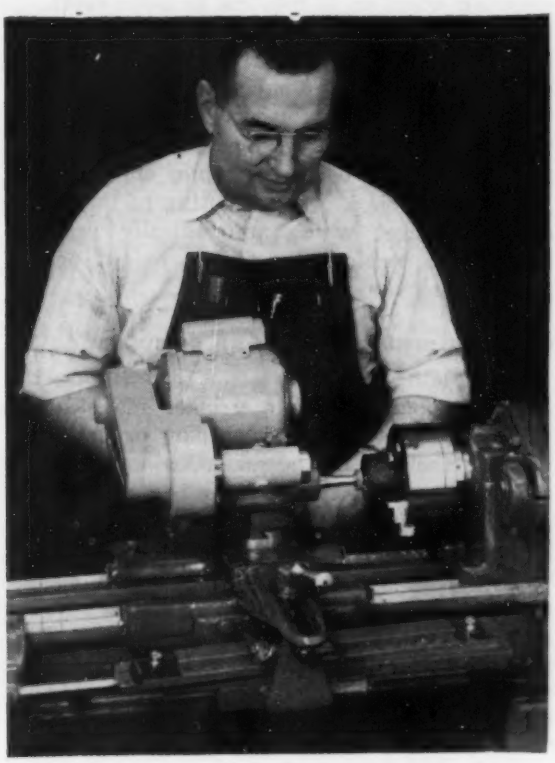
T-wrench makes offset adjustment

A T-wrench is used in a hole in the upper part to make the offset adjustment. An incorporated graduated dial, in connection with a vernier scale in the body of the tool, allows readings to be taken as fine as 0.0001 in. The principle is the same as that of an offset boring tool.

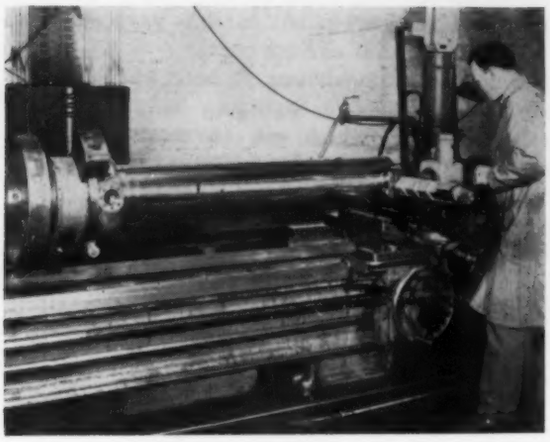
Flexible shaft layouts often are employed at the lathe for grinding. Undoubtedly external grinding applications of this kind are more familiar than internal grinding setups. Some flexible shaft machines, however, have internal grinding attachments. These are designed to mount directly in the T-slot of the lathe compound.

Larger toolpost grinders often have the grinding wheel arbor directly on the end of a motor spindle. The motor may be ¼ to 1 hp. An extension mandrel can be threaded onto the end of the regular wheel arbor, on some of these units, to

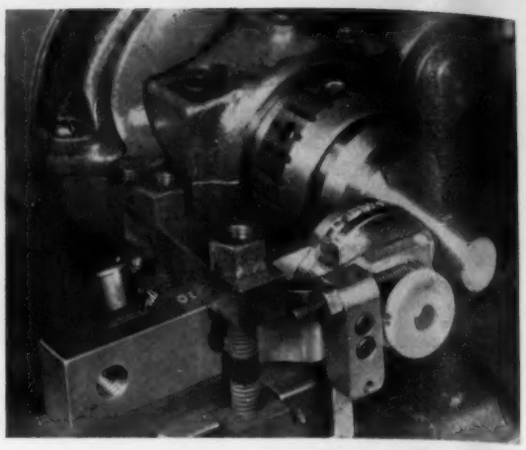
GRINDING ATTACHMENT for bench lathe. Attachment is held in toolpost, driven by electric motor through a flexible shaft, pulleys, and a belt.



SPECIAL GRINDING attachment for internal grinding on lathe. Compound drive produces extra-high speeds.



SUPERFINISHING attachment in use on long workpiece. This lathe attachment carries two abrasive stones which can oscillate 375 times per min over a ¼-in. travel.



MARKING device in use on a lathe. Mounted in toolpost, the accessory holds either solid or interchangeable type.

Lathe accessories (continued)

make them adaptable for internal grinding. A special rest is furnished with some to be used when grinding cutters or reamers. Some of these grinders incorporate no feed of their own, the standard lathe feeds being sufficient.

Where grinding attachments are meant for use on both lathes and other machines, they are provided with a horizontal feed of their own, actuated by a convenient handscrew. While there are various types of grinding work for which such toolpost grinders are ideal, they do not provide as great clearance across the face of the grinding wheel as is required in some cases.

Other heavy-duty toolpost grinders provide a maximum of clearance across the face of the grinding wheel for external lathe grinding. These have their motor mounted on a bracket well above the line of work centers, and a motor pulley connected to the grinding spindle by a belt. Some have a pivot mounting of the motor on its bracket which automatically provides proper belt tension, due to the weight of the motor, at all times.

Grinders mount directly on compound

Many lathe grinders mount directly on the lathe compound. Such a grinder mounting is inherently rigid, eliminating play or deflection between toolpost and shank. One grinding attachment used in this manner is known as an angle plate grinder, because its mounting plate is of right-angle design. It has a base which fastens firmly to the lathe compound, and a riser at right angles to the base, on which the grinder proper is mounted. These grinders have either vertical adjustment or vertical feed. When provided with vertical feed, there is a vertical handscrew operated by a handwheel or by a crank.

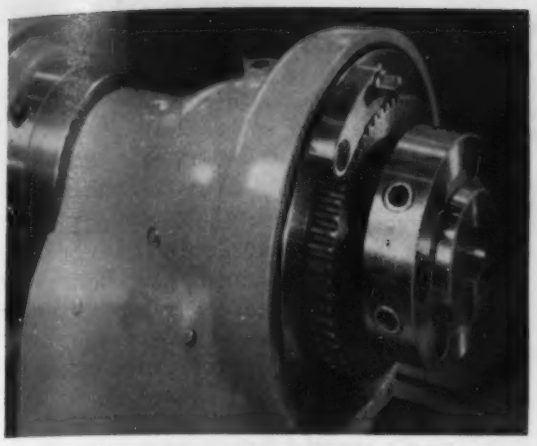
Many lathe grinders have their driving motor located above the grinding spindle and well toward the operator, with a belt drive connecting the motor to the spindle or quill. One such, designed to mount on the compound rest of lathes 9 in. and larger, will grind work within 2½ in. of maximum lathe swing. The grinder may be swiveled around the clamping bolt as desired. The motor is adjustable for maintaining proper belt tension, and provision is incorporated for changing spindle height. Another similar lathe grinder is fitted with a special V-belt drive which permits speed changes to be made as required.

One line of lathe grinders has been designed to receive interchangeable quills. Through use of quills which most appropriately match lathe-grinding needs in any given shop, these grinders are made much more versatile, while maintaining a high degree of accuracy. As many as 10 or 11 different quills are made available for the same lathe grinder in some cases.

One type of quill is for external grinding only. Another type receives and uses mounted wheels. Still another is for internal grinding, but incorporates a grinding-wheel arbor, with proper collars and abrasive wheels. All these are provided with two ball bearings. Wherever internal grinding is to be done in holes 6 in. deep or more, special quills with three bearings are employed, and different quills are provided for different grinding depths. Quills of insert-spindle type are also employed, and various kinds of insert spindles may be obtained to go with them.

Some grinders are provided with reverse rotation and may be positioned on the back of a lathe for use. There is a mounting post in the grinder frame which clamps to the lathe compound. The operator removes the lathe toolpost, then takes the mounting post from the grinder frame, slipping the head of the post T-bolt into the lathe compound slot and tightening it. The grinder proper is then slipped down over the post until it lines up at the approximate center line of the work, where it is locked to place. The required quill is then put into the grinder frame and locked in position.

A great variety of grinding can be accomplished at the lathe through use of such ma-



SUB-HEADSTOCK bolted to lathe bed in front of headstock, driven by headstock spindle. Gearing reduces spindle speed without changing speed of carriage traverse, for chasing multiple threads and coarse leads.

chines. In a few instances, special cutters have been used on these machines instead of grinding wheels, for out-of-the-ordinary work. A case in point is where a grinder of this type, fitted with a special milling cutter, is used on the back of a lathe carriage for cutting threading in fibre studs.

One grinding attachment is compound-belted. There is a belt drive from the motor pulley to an intermediate shaft, and another from this shaft to the quill spindle. This attachment is meant for internal grinding. Compound belting is used to obtain high speed on the spindle quill, which runs at 30,000 rpm.

Honing attachments available

Abrasive operations other than grinding are performed on the lathe, with particular regard to production of better-than-ordinary finishes. Honing tools applicable to external cylindrical surfaces are in use. For instance, a single tool of this kind is applicable to all such parts within a ½ to 2½ in. diam. range. Die pins, guide pins, shafts, plungers, piston rods, spindles and rollers, are quite often honed with tools of this nature.

Superfinishing provides a surface of higher accuracy than honing, and in many cases the lathe is a logical place to do such work. There are various sizes of superfinishing attachments available for lathe use. Such an attachment mounts on the cross slide. While lathe superfinishing attachments are chiefly employed for toolroom and experimental work, they are nevertheless used on production where quantity of such work is too small to make profitable use of a superfinishing machine.

The largest models of superfinishing attachments available for engine lathes allow quick changing of stone holders. Any number of stones from 1 to 4 may be used. Oscillation frequency of the stones on any of these attachments is adjustable, though smaller models may have their stones oscillated at higher rate than larger ones. The smallest attachment used can have its stones oscillated as many as 550 times per min. The largest has a maximum oscillation rate of 250 strokes per min and a minimum of 42.

As in honing, combined rotation of the workpiece with oscillation of abrasive stones produces a cross-hatched pattern on surface of the work. No abrasive grit ever travels the same path twice. Each stone is self-shaping to correct average diameter. Superfinishing does not take nearly as much time as some have supposed. There are countless cases where its adoption would be well worth while, even on an engine-lathe basis.

A lathe may be used as a marking machine for cylindrical parts. This is done by employing special roll-type markers, held in the toolpost. Such markers have their greatest value on automatic screw machines, but are quite often used at the lathe. They may employ solid-roller dies on which suitable marking type have been engraved. Or, where many different types of parts are to be marked, and relatively few of each kind, marking roller holders may be obtained with a font of replaceable steel type.

Carbide files used

Of recent years, files seem to be used less for lathe finishing purposes, but are considerably employed for removal of burrs from sharp corners, or removal of flash from plastic parts revolving in the lathe. For these purposes, files of tungsten carbide are very popular. These can be used for finishing should need appear. They readily cut steels, up to 62 Rc, which no ordinary file will touch. Filing speeds are greatly increased with such files. Comparative working tests indicate they will outlast steel files 50 times or more.

Replaceable carbide file inserts are put into special handles, to which they are attached with screws. Some of these inserts are provided with serrations having a shear angle of 30° and a 15° negative rake. Inserts with finer teeth than are employed on steel are used for brass, bronze or similar materials. It is possible to obtain special cuts when desired in order to provide best possible cut for the most difficult filing job. A coarse and a fine cut can be placed on the same handle, or multiples of different file cuts on special holders.

Work driver eliminates dogs

Proper driving of different types of work at an engine lathe often consumes considerable time, for dogging takes time. To eliminate dogging, it is often possible to use an automatic work driver. This is a device which fits directly on spindle nose of the lathe. It is provided with floating, serrated jaws. Gripping and driving action of the serrated jaws increases automatically in proportion to depth of cut being taken.

One device of this nature is made for a standard line of lathes. It has two sets of standard jaws, which have capacity ranges from 1 to 2¼ in. and from 2¼ to 3½ in., respectively. A third

set of jaws is available when desired, which has capacity from ½ to 1¼ in. Because jaws are of floating type, they compensate for reasonable amount of eccentricity. Either roughing or finishing jaws may be used. Finishing jaws have more shallow serrations than roughing jaws.

Bench lathes are quite often fitted with some kind of index plate. Generally there are notches in the rim of the plate. A pawl or a spring-loaded finger is usually provided to engage selected notches. One index plate of this type may have any number and arrangement of notches up to 360.

Another light lathe has a bracket which mounts on the headstock. The bracket carries a finger to engage the index plate. In this case, standard index plates are provided which may have 46, 56, 60, 64, 72, 80, 84 or 100 notches. Sometimes, engine lathes used for chasing multiple-start threads are fitted with multiple-indexing face plates. While such devices are chiefly used on toolmakers' lathes, they can be employed for chasing multiple threads anywhere. Some of these have an indexing plate provided with graduations for engaging teeth of an index gear, to produce 2, 3, 4, 6 and 8 multiple-start threads.

Ball turning rests used

Ball turning rests are of great importance in many places, and are provided for their lathes by different manufacturers. Knobs and hemispherical ends on workpieces, ball reamers, universal and swing joints, ball-type cutters and punches, knuckles, balled valve seats and discs, are all machined to high advantage with aid of a ball turning rest. One small lathe may be equipped with a ball turning rest mounting directly on the lathe bed. There is a lower cross slide incorporated, which has transverse screws for centering the tool. A top slide, which carries the tool post, has a feed screw to adjust the tool for radius.

One ball turning rest is equipped with a bottom slide which may be positioned on center for either ball turning or spherical boring. In addition, it may be positioned off center as far as required for turning spherical radii. Circular swing of the tool on this device may either be imparted by hand, or by power cross feed.

An accessory for use on engine lathes in plants which must chase extremely coarse leads is known as a sub-headstock. Function of this device is to change the overall ratio of rotary headstock speeds to carriage traverse speeds as provided by the lead-screw, making it possible to machine leads far more coarse than chased.

Cuts spindle speed 6:1

One such device bolts directly to the lathe bed in front of the headstock, and is driven by the headstock spindle. It houses reduction gearing by means of which spindle speed is reduced on a 6 to 1 basis without changing speed of carriage travel. There is usually a multiple indexing face plate used in connection with a sub-headstock.

Another speed-adaption device for engine lathes is a constant-surface-cutting-speed attachment. It is well known that on facing operations, for instance, surface cutting speed is very high under normal circumstances when the cut begins at the outer edge, and that cutting speed continually reduces as the tool feeds toward the center. Attachments can be obtained to make this cutting speed constant, thus placing it on a far more efficient basis. Such devices are especially recommended for use on facing work.

However, usefulness of such an attachment extends beyond facing work. It will also provide constant cutting speed during turning or boring operations, when the tool is being set for various diameters of work. Again, when the constant surface cutting speed function is not being employed, the unit will provide infinitely variable speeds from the top of the speed range down to ¼ of the slowest normal lathe speed.

Cleaning station in strip line cuts handling

To produce an absolutely clean, uniform surface on cupro-nickel, nickel-silver, and certain bronzes processed in its strip mill, Riverside Metal Co. set up a cleaning operation following annealing of strip in their Drever continuous annealing furnaces.

The controlled atmosphere furnace usually eliminated conventional pickling operations to remove scale. To produce the surface desired on special runs, however, a brief cleaning was necessary. This removed dirt, superficial carbon resulting from burned lubricant remaining on the surface, and zinc "sweat," a surface deposit or dross occurring on zinc-containing alloys.

The new cleaning unit, installed between annealer and recoiling block cuts out cumbersome handling.

Annealed strips, moving at 3 to 15 ft per min, are guided to a 10 pct sulfuric acid bath at room temperature. A cold water jet thoroughly washes both sides of the strip. Next a hot water jet bath, at about 190°F is blasted against the strip. Finally, the strip is pulled through a hot air drier. Air, heated by being drawn through a steam jacket, is blown against the material.

Rubber pinch rolls engage the strip and deliver clean material to the take-up drums at the discharge end of the line. The station, installed during a recent 2-week shut-down period, has cut 40 pct from the time previously required for this operation.

Free Literature—

Continued

Synchronous motors

Standard construction features of low speed, coupled-type, pedestal-bearing synchronous motors are described in a new 6-p. booklet. The motors are applicable to direct-coupled drives with such widely varying torque requirements as ore or rock grinding mills, Banbury mixers, and pumps. Motors are available in ratings of approximately 100 hp or more at speeds of 450 rpm or less. *Allis-Chalmers Mfg. Co.*

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Chucks

A new 68-p. booklet, *Chucks and Their Uses,* profusely illustrated with photos and drawings, describes all types of standard and many special chucks. Details of construction, use and mounting are included. Chapters cover the care, lubrication and cleaning of chucks spindle noses and vises. Apprentices, trade school students and operators will find the booklet especially valuable. *Skinner Chuck Co.*

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Spade, core drills

Interchangeable spade and core drills provide advantages in drilling large holes, deep holes, and holes in hard and tough metals. A new 52-p. book describes types, sizes and use of these drills. The drills have greater resistance to end thrust, torque and bending. Drills have small dead centers and cutting angles provide better support of cutting edges. *Conner Tool & Cutter Co.*

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Precision reamers

A new 12-p. brochure illustrates the DoAll line of precision reamers. Detailed listings give technical data and prices on chucking, expansion, shell, taper pin and stub screw machine reamers. Diemakers' reamers, not usually cataloged, are included. *DoAll Co.*

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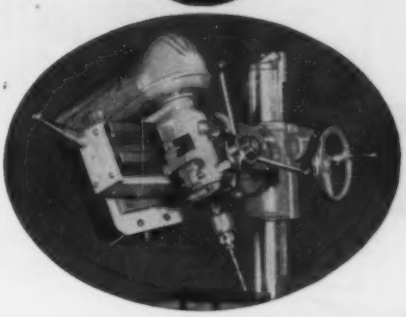

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Furnace equipment

A new 4-p. bulletin will facilitate selection of furnace equipment for the manufacturer of large caliber ammunition. Sections of the bulletin are devoted to production of high explosive projectiles, armor piercing projectiles, steel cases and brass cases. Illustrations and descriptive information for each heat treating operation are arranged in production sequence with batch and continuous furnace type included. *Surface Combustion Corp.*

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Industrial trucking

A new 32-p. booklet, *How the Products of Clark Serve Industry*, describes a wide line of industrial trucking equipment. Axles and transmissions for trucks and buses, and the many items which contribute to lower materials handling costs are depicted. A complete listing of Clark's U. S. and Canadian dealer organization is included. *Clark Equipment Co.*

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Welding procedures

Oxyacetylene torch, metal-arc, carbon arc and inert-gas-shielded arc welding techniques are discussed in a new edition of the booklet *Anaconda Welding Rods and Procedures*. Applications and methods are suggested for production and repair welding, and for building up worn surfaces with bronze rods. Welding data and Government specifications are included. *American Brass Co.*

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Clutches and drives

A 32-p. "Cross-Country" issue of *Production Road* describes more than 50 applications of friction clutches and hydraulic drives in heavy machinery. Emphasis is on the applications for Twin-Disc 3-stage hydraulic torque converters in machinery for logging, construction, mining, land and water transportation. *Twin Disc Clutch Co.*

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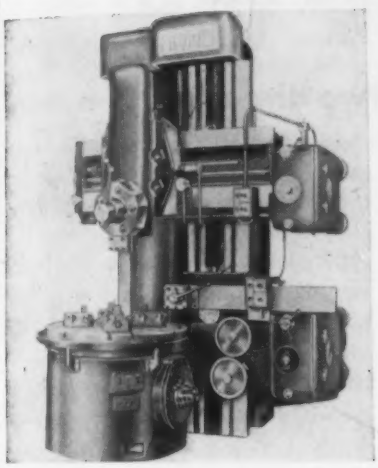
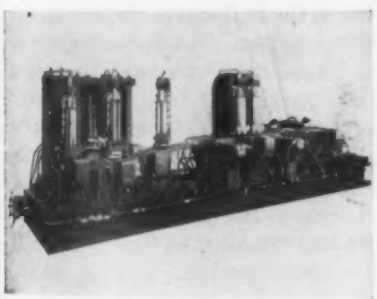


Vertical mills provide precise machining

Froriep single column vertical boring and turning mills are ruggedly constructed to provide precise machining, extremely smooth surfaces and maximum cutting efficiency with carbide or high speed tools. The rigidly bolted bed and column and wide base are heavily ribbed for quiet machining, even under heaviest loads. The cross rail slide head and the side arm head are completely independent. Each is controlled by an individual set of feed and rapid return gears. The geometrically graduated feeds for vertical and horizontal travel of the tools are controlled by three centrally placed levers. Engaging of feeds and rapid return is effected by single lever control from operator's stand. The mills are made in four sizes having 39, 49, 55 and 63 in. diam table and will take workpieces weighing up to 5 tons. *Cosa Corp.*

For more data insert No. 26 on postcard p. 119



New press operations use special equipment

A wide range of new piercing, rimming and riveting operations is possible through application of a special hydraulic cylinder to new metalworking equipment. Built-in automatic blankholding and stripping action requires no springs and is actuated hydraulically after the power stroke. Compactness and rigidity of this construction permit producing holes under difficult conditions. The hydraulic system features continuous pressure intensification that permits wide flexibility in adding cylinders. *Danly Machine Specialties, Inc.*

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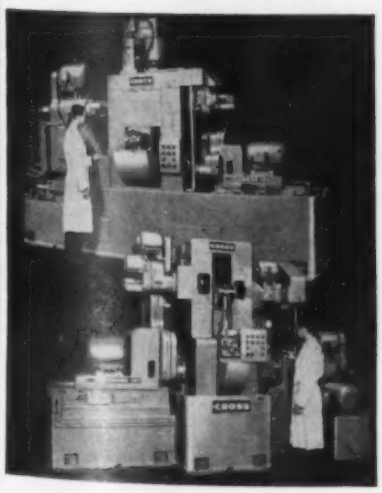

Machine tool processes transmission extensions

A unit of two special machine tools for processing transmission extensions finishes 125 pieces per hr at 100 pct efficiency with one unskilled operator for each machine. The first machine is a four station trunnion type with fluid motor, power indexing. At this machine both ends of the extension are bored, the large end is faced, the flange holes in the large end are reamed, an oil groove is machined in the small end, and two holes are chamfered and tapped in the mounting pad. Machine number two is a six station trunnion type, in which the mounting flange is milled; the speedometer hole is drilled, bored, chamfered and tapped; and two inspection cover holes are drilled, chamfered and tapped. Other features include: hardened and ground ways, J. I. C. standard construction, lead screw feed for tapping and hydraulic feed for drilling, boring and reaming. *Cross Co.*

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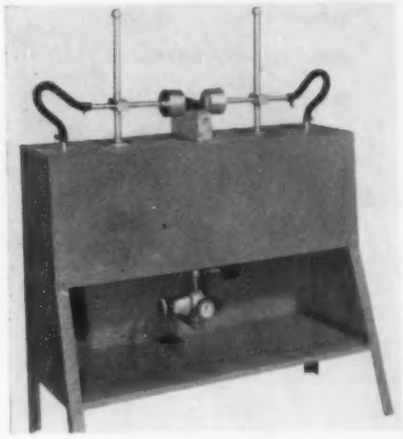
Turn Page



New technique replaces carbide tool tips

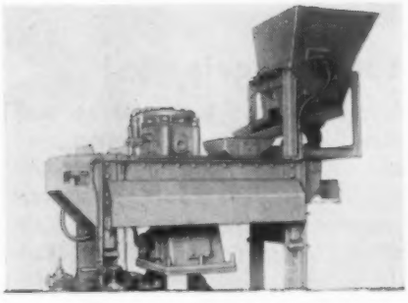
A simple, speedy, and economical arrangement for brazing of carbide tool tips on tool shanks uses intensified local heating that makes it possible to use a higher temperature (bronze) bond in lieu of silver solder. Premixed gas and air is conducted to a pipe tee and distributed through flexible connections to two refractory-cup radiant gas burners. The tool shank is placed between these two burners where a maximum rate of radiant heat transfer to the tool is obtained. The heat is caused to flow toward the tool end (and the carbide tip) rather than away from it. Tips are removed and replaced on 1½x1-in. tools in 2½ min overall, it is claimed, and on 2⅝x1½ in. tools in 4 min. Convenience of the arrangement facilitates getting at tool tip for fluxing and manipulating the braze. *Valley Machinery & Supply Co.*

For more data insert No. 29 on postcard p. 119

Electric hand tool cuts in two directions

A portable electric contour cutting hand tool is easily held and guided on the job to follow concave and convex curves and at the same time moved upward or downward to cut in two directions. The tool can be operated with ease by both skilled and unskilled personnel. It will cut and shape wood, plastic, masonite and do light cutting of nonferrous metals and alloys. The handshaper can be operated in any position for those otherwise difficult and time consuming operations wherever 115 v 60 cycles ac or dc electrical current is available. The tool is furnished with one cutting head, two high speed adjustable cutting blades. *Composite Die Supply Co.*

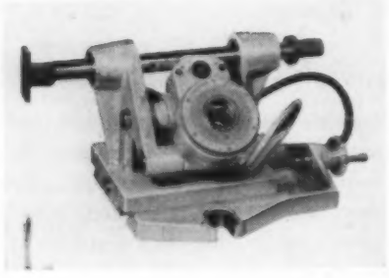
For more data insert No. 30 on postcard p. 119



Sand feeder eliminates time-out periods

A new non-clogging vibratory sand feeder provides a completely automatic flow of sand into the core blower. Because of its vibrating action, sand is delivered in an ideal condition for blowing. No attention is required from the operator once the feeder has been timed with the cycle of the core blower. It will not overfeed. When the hopper is full, sand delivery stops. The feeder is powered by two noiseless rotary type vibrators; is available in 4 and 6 cu ft capacities for chute and dump bucket loading. *Wm. Demmler & Bros.*

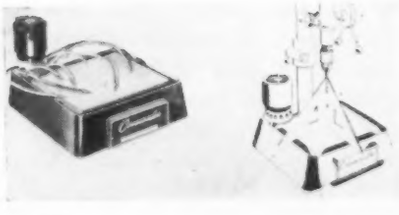
For more data insert No. 31 on postcard p. 119



Gaging device measures cam angles, contours

The cam rise gage measures cam contours, both angle and amount of eccentricity, by optical means, and can simplify and speed up accurate eccentricity measurements. The deviation in a cam surface at any angle of arc, from minimum to maximum radii, can be quickly measured to ten thousandths of an inch. Reading is direct at normal eye distance, no focusing is necessary. Simplicity reduces chances for human error to a minimum. *F. T. Griswold Mfg. Co.*

For more data insert No. 32 on postcard p. 119



Self-contained drill table has coolant system

Equipped with a built-in pump and reservoir and eight semi-rigid, flexible metal coolant nozzles, a new coolant table with a shorter coolant circulating stream delivers full volume flow from its one to eight nozzles. Flow from each nozzle may be individually controlled. *Commander Mfg. Co.*

For more data insert No. 33 on postcard p. 119

Cushion wraps

new, exterior-interior wrap for e delivery of products to market a completely flexible, laminated inkled protective wrap that pro- es slippage to safeguard against eakage and damage. Sof-Rap nsists of one sheet of two-way xible krinkled cushion paper, ip laminated to an equally flex- e, tough krinkled kraft paper. e interior sheet provides a soft, ilient cushion while the strong nctional kraft outer sheet will thstand extreme scuffing and rasion without tearing. It folds d forms readily to any contour ape without breakdown. Another rap called Krepak is Sof-Rap thout the kraft exterior sheet. *chols Paper Products Co.*

r more data insert No. 34 on postcard p. 119

re-painting treatment

e phosphatizing action of An- orite 100 changes the surface of eel, iron, zinc and cadmium parts to an inert phosphate compound hich is highly resistant to corro- on, and which provides an excel- nt base for organic coatings. It said to give uniform results and a treatment that meets armed rvices specifications. Since An- orite 100 surface is nonconduc- ve, electrochemical breakdown annot occur; the phosphate com- ound acts as an insulating barrier tween the metal and paint. Ap- lication is by immersion or spray. *Octagon Process, Inc.*

r more data insert No. 35 on postcard p. 119

One-at-a-time

ne-at-a-time dispensing and ap- lication are featured in stacked pen-type retaining rings that re- ce normal assembling time. Loss rings through handling is com- etely eliminated. A base holds e ring stack erect, permitting hem to be readily dispensed and pplied with one hand and with one ontinuous motion using an appli- ation tool. Rings are carbon steel. *Industrial Retaining Ring Co.*

r more data insert No. 36 on postcard p. 119

Turn Page

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Made in a wide range of capacities to serve your most varied punching needs.

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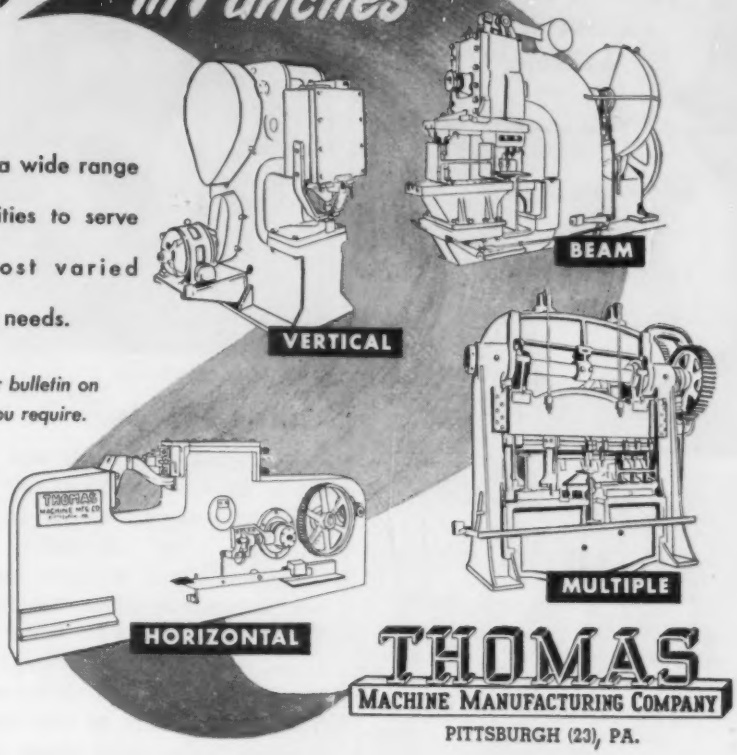

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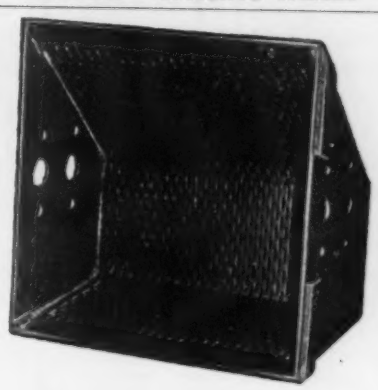
24

PUNCHES • SHEARS • PRESSES • BENDERS • SPACING TABLES

Typical of Hendrick's Manufacturing Facilities



Hendrick is exceptionally well equipped to manufacture to specifications a wide range of metal products that involve such operations as perforating, shaping, forming, welding, brazing, riveting, etc. The perforated elevator bucket illustrated is typical of the many specialized articles for whose fabrication Hendrick has unusual facilities. Write in detail regarding any metal product you desire fabricated.

1876—Seventy-Fifth Anniversary—1951

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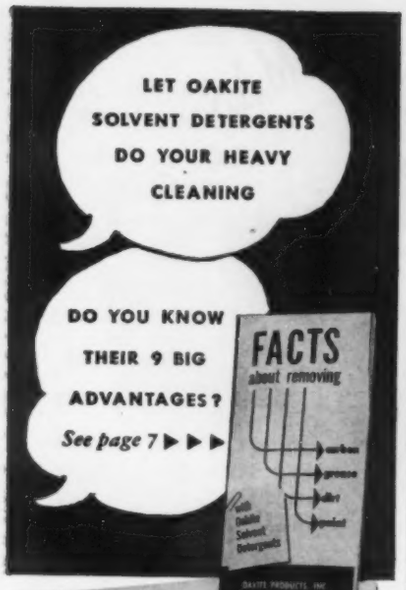
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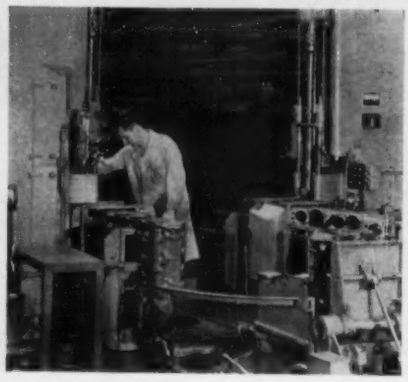


Guided tools

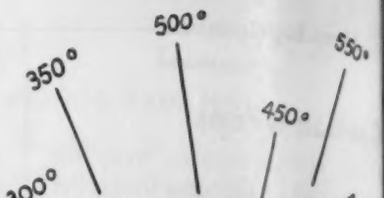
New guided type tools and automatic machines productively hone main bearings to 0.0005 in. total tolerance for alignment, size, roundness, and straightness. In one automobile plant bearings in V-8 cylinder blocks are being honed at the rate of over 60 blocks per hr. The operation is entirely automatic. The two columns of the machine are set facing each other in the conveyor line. Blocks are taken from the line, automatically tipped up on end and transferred to the fixture of either column. Automatic Microsize controls the honing cycle. As the block is finished it is indexed onto a tilting table and back to the conveyor line. Alignment is generated by a special guided tool. Guides stabilize the tool as the abrasives pass from bearing to bearing. One operator tends two machines, spot checking the bearings with an air gage. *Micromatic Hone Corp.*

For more data insert No. 37 on postcard p. 119

Master switch

A redesigned master switch features a new cast-aluminum cover and up to five adjustable stops. For heavy-duty installations, the dust-proof switch will find application on large materials handling equipment such as steel mill type cranes. Standard equipment includes ball and rod handle, but four other types of operator are available. Switch is interchangeable in size and mounting with former GE types. *General Electric Co.*

For more data insert No. 38 on postcard p. 119



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No. 102	from 400° F. to 450° F.
No. 103	from 450° F. to 500° F.
No. 227	from 300° F. to 450° F.
No. 237	from 450° F. to 500° F.
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There's a "hot spot" lubricant in this line-up for every temperature in the critical range—so you needn't depend on "guesswork." Simply pick the operating temperature and the Hi-Temp Oil is there to do the job . . . *right* the first time! To keep production going, make sure of your lubricants by specifying Hi-Temp Oils.

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Ready to give you on-the-job service . . .

—New Equipment—

Continued

Massive grinder

Jet engine components will be processed on a new heavy production grinder. The wheel slide takes a 30-in. diam grinding wheel and swivels 180° by power, permitting rapid angular settings. It clamps hydraulically and is operated automatically through an interlock on the swivel motor switch. The machine grinds work to 42 in. diam. Long, full bearings enclose a major portion of the spindle body providing extreme resistance to deflection by wheel pressures. Settings in work diameter reduction as fine as 0.0001 in. are possible. A sliding table supports a swivel table for grinding taper work. *Norton Co.*

For more data insert No. 39 on postcard p. 119

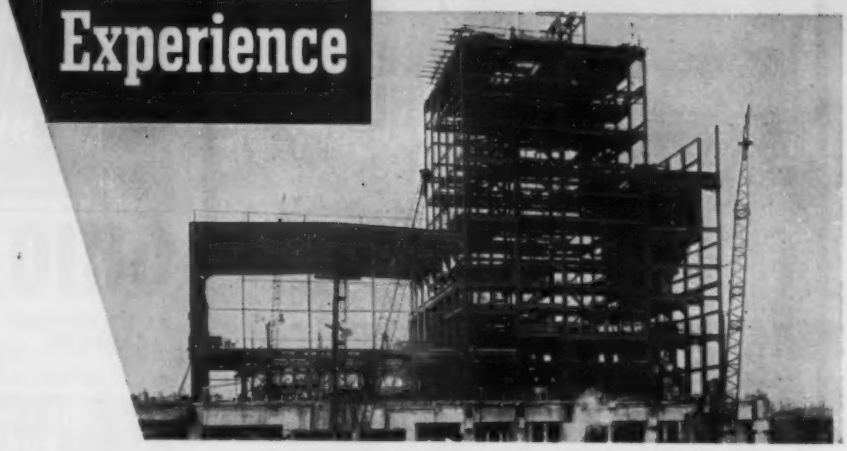
Full-revolving derrick

A self-contained, full-revolving steel derrick, available with either gasoline or electric power, can be swung by hand or power. Having a short tail swing of 5½ ft and requiring no stifflegs or guy lines it occupies a minimum of ground space which permits it to be set up and operated in congested areas. The rotating structure that supports the boom and boom supporting members also supports the hoisting machinery. Boom lengths of 20, 30 or 40 ft are available with load capacities from 2000 lb at 40-ft radius to 10,000 lb at 10 ft radius. *Clyde Iron Works, Inc.*

For more data insert No. 40 on postcard p. 119

Turn Page

Experience



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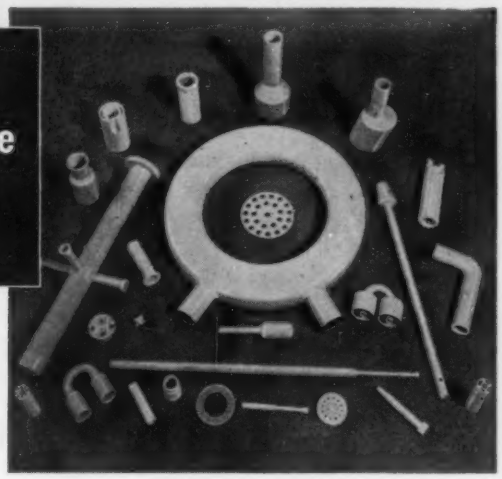

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Sheet metal saw

Designed for production work in metal, plastic, sheet metal and woodworking shops, a new sheet metal saw has a speed range from 125 to 2200 fpm giving quick selection of correct blade speed for material to be cut. The machine takes up to ½ in. wide blade and has extra depth 8¾ in. cut adaptable to finish castings. Fifty or more stacked galvanized sheet metal can be cut at speeds to 15 ipm. The 20x22-in. table is adequate for large work. *Bett-Marr Mfg. Co.*

For more data insert No. 41 on postcard p. 119

Precision machines

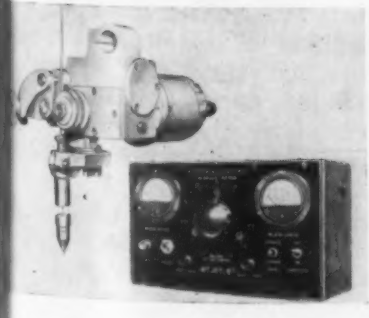
Five new Huller automatic tapping and threading machines are for mass production. Operation cycles are entirely automatic. The machines have positive electrical controls, exact limitation of feed depth, wide ranges of speeds, and very high output. The machines are spindle fed at pitch of thread being cut and are simple to operate. *Carl Hirschmann Co.*

For more data insert No. 42 on postcard p. 119

Saving fuel

Known as Motor-Mount, new condensation units effect saving in fuel by returning the condensate from steam coils, radiators, or steam operated equipment back to the boiler. Centrifugal pumps used on these units have enclosed type bronze impeller and stainless steel shaft. Forty-four unit numbers, single and duplex, handle from 2000 to 40,000 sq ft of radiation. *Deming Co.*

For more data insert No. 43 on postcard p. 119



Welding head

Principal performance feature of a new welding head is its automatic control of both head and positioner operation. A rugged electromechanical control circuit automatically stops both head and positioner drives if the arc is broken or the electrode sticks to the workpiece. *Mir-O-Col Alloy Co.*

For more data insert No. 44 on postcard p. 119

Turn Page

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WIRE ROPE WITH
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America's largest-selling
DROP-FORGED
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SIZES for ⅛" to 3" WIRE ROPE
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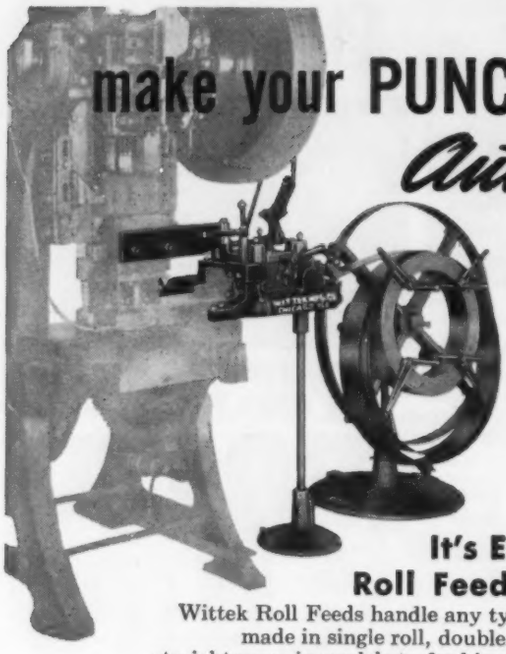

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Wittek Roll Feeds handle any type of coiled strip stock and are made in single roll, double roll, and compound types with straighteners, in models to feed in any of four directions. They are reliable and accurate with simple, quick adjustment of feed length. Standard sizes and models meet a wide variety of press size and capacity conditions. Wittek Reel Stands facilitate handling coiled stock.

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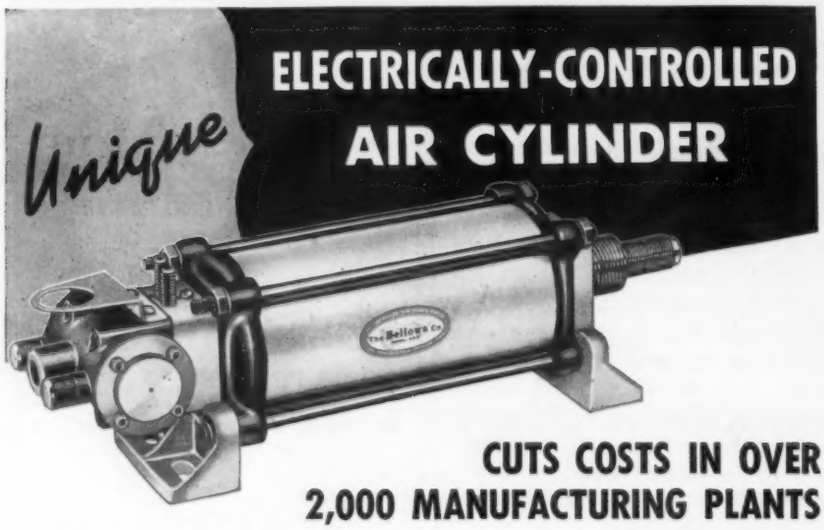

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SMALL, powerful, precision made for precision work, Bellows Model BSM straight line, non-rotating Air Motors replace manual push, pull or lift movements in all kinds of machine operations.

Bellows BSM Air Motors are complete power units with built-in electrically-controlled, air-powered air valve, and speed controls. Speeds up to 2,200 movements per minute. Cylinder bores 1¼", 2½", 3⅜", 4½". Any stroke length. • **WRITE FOR BULLETIN BM20.**
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The Bellows Co.
Akron, Ohio

—New Equipment—

Continued

Arc welder starter

A new type starter, basically a fused high-capacity interrupter switch, is being used on production models of GE motor generator dc arc welders. The starter provides positive motor starting because contacts are locked in by mechanical action. A direct-acting lever physically closes or opens the contact when it is operated, affording direct control over starting and stopping. This eliminates intermediate circuit coils or magnetic contacts. Pitting and erosion on contact tips is reduced by eliminating chattering or misstarts. A time-delay fuse connected directly in the line protects the motor circuit from overload. *General Electric Co.*

For more data insert No. 45 on postcard p. 119

Barrel finishing paste

A special purpose chemical for barrel finishing brass, bronze, copper, gold and silver stampings, castings, machined and drawn parts is a highly concentrated paste for use in very small quantities. It is said to yield uniform metallic colors at greatly reduced time cycles on all operations. Known as Blue Magic No. 1, the compound is recommended for finishing with or without media, and with selected nonferrous media for roughing, deburring, cleaning and finishing in a single operation. *Blue Magic Chemical Specialties Co.*

For more data insert No. 46 on postcard p. 119

Package imprinting

A new automatic package imprinting machine is a compact, friction-powered production-line attachment that will produce spot-registered imprints of code-dates, weights, sizes, and various other supplementary information on small-size cartons. It also imprints cans, canisters and bottles. Four lines of copy can be printed occupying 1x6-in. space. A Metalok type-holder locks the interchangeable rubber type in place; it cannot slip or move out of position during imprinting operations. *Adolph Gottscho, Inc.*

For more data insert No. 47 on postcard p. 119

aterials Handling:

oller track and elevator combination speeds Stewart-Warner parts

Roller-track sections installed seven elevator landings at ewart-Warner Corp.'s Chicago ant permit a moderate-capacity is freight elevator to move over 0 tons of pallet-loaded automoe instrument and Alemite parts tween floors each day.

This truck-conveyer-elevator maial handling system allows the rk-truck operator to pick up a llet load of materials, parts or ished goods, carry it to the eletor landing, set it down on the ack outside the elevator, signal e elevator and then go for anher load.

The elevator attendant pulls the aiting pallet onto a roller conyer in the elevator, carries it to e first floor, and pushes it off nto a roller track on the landing tside the elevator.

One man can run the elevator d move loaded pallets on and f. Because there are front and ar entrances to the elevator at e first floor landing, roller tracks re installed outside both doorays.

Loads of 500 to 2000 lb are easy handle. In some cases, a pallet ck is used instead of a lift truck carry loads to and from track ctions. The elevator rear entrance is equipped with a powerperated hoistway door operated om the front of the car. The eletor can make 265 round trips per hr day, carrying one or two palks per trip.

Mill Machinery:

Lighter, more efficient slip regulators handle impact load peaks . . .

A new type heavy-duty slip regator designed to more efficiently ke up impact load peaks of steel ill motors was described at the ll general meeting of the Amerin Institute of Electrical Engineers.

In developing the new regulaor, emphasis was on more compact design and reduction of eight, higher electrode efficiency, igher efficiency and more flexibility of the cooling system, better accessibility.

The unit is self-contained and includes the heat exchanger to form a completely closed circulating system.

Outstanding features are: Three separate cell assemblies insulated from each other; forced electrolyte circulations instead of natural convection; a modern heat exchanger for maximum cooling efficiency and a simple operating mechanism and regulating system.

Slip regulators have been used since 1913 in steel operations, especially blooming mills where the heavy impact load peaks of mill motors would result in excessive power surges.

Enamel Resists Corrosion

A new porcelain-like enamel, designed to provide long-lasting resistance to weather and abrasion, has been developed by the United Lacquer Mfg. Corp.

Excellent resistance to the weather, chipping, abrasion, mechanical abuse, salt-spray, alcohols and acid solutions is offered.

The enamel will prove valuable for use where the atmosphere contains a high concentration of corrosive materials, such as sulphur.

Speeds Metal Analysis

Rapid qualitative and quantitative analysis of constituents in metals, alloys, minerals, ores, chemical mixtures and compounds is possible with a new Norelco fluorescence analysis unit.

Specimens under analysis are exposed to an intense beam of exciting X-radiation. This results in individual X-radiations being generated by elements susceptible to such excitation. The combined radiations representing the various constituents are passed through a special collimating system to a crystal analyzer which reflects individual radiations at specific angles.

Intensities are measured by a Geiger counter arranged with the crystal and its angulating mechanism on a specially designed goniometer.

L&J PRESSES

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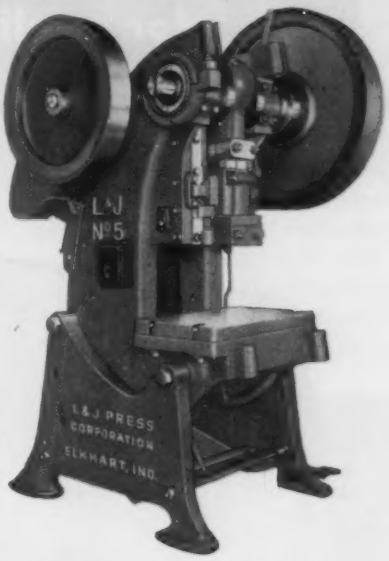
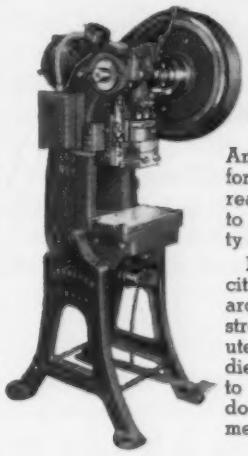


The rigid accuracy of L. & J Presses gives you better work — closer tolerances and better finishes — with a minimum of maintenance. It is the result of their heavy construction, advanced design and skilled workmanship. This dependability can mean lower production costs for you.

No. 5 Back Geared Press (illustrated above)

50 ton capacity, 4" standard stroke, 45 strokes per minute, 10¼" or 15¼" die space (bed to slide, stroke down, adjustment up).



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An ideal press for small work, readily adapted to a wide variety of jobs.

14 ton capacity, 1½" standard stroke, 144 strokes per minute, 7¼" or 9¼" die space (bed to slide, stroke down, adjustment up).

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12 models—6 to 80 tons

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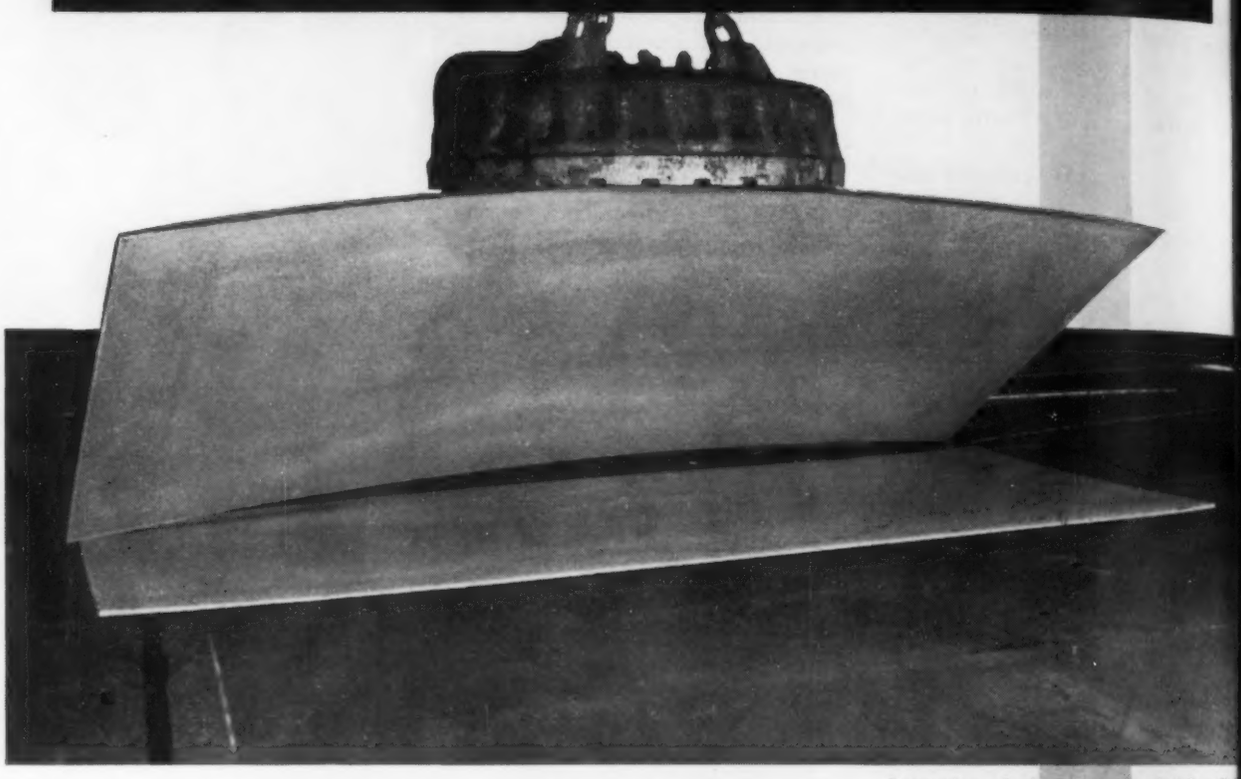
Specify C. F. & I. "Ferro Bond" STAINLESS-CLAD STEEL for quality and resistance to corrosion

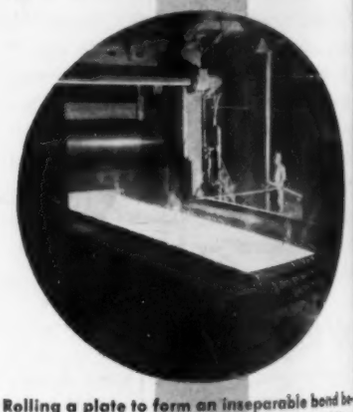


Separation of plate into two Stainless-Clad plates by electromagnet after rolling.

Substantial savings in cost, plus extra strength and long life recommend the use of C. F. & I. "Ferro Bond" Stainless-Clad Steel for numerous purposes where high resistance to corrosion is essential.

C. F. & I. Stainless-Clad Steel (a composite of carbon steel and stainless steel inseparably bonded together) is produced under close quality control... rolled with painstaking care under specialized supervision to insure absolute uniformity of the stainless steel cladding.

For additional information on the production savings possible with C. F. & I. Stainless-Clad Steel and the many applications where it can be used to good advantage, write to Claymont Steel Corporation, Claymont, Delaware.



Rolling a plate to form an inseparable bond between carbon steel and stainless steel cladding.

C F & I

Large Diameter Steel Pipe... Carbon Steel Plates... Flanged and Dished Heads

STAINLESS-CLAD STEEL

PRODUCT OF

CLAYMONT STEEL CORPORATION

SUBSIDIARY OF THE COLORADO FUEL AND IRON CORPORATION

Expect Peak Steel Demand for Defense by Mid-1952

Peak will hold a few months then gradually recede . . . Output of military goods to lag material peak about 6 months . . . Steelworkers start softening up process for wage demands.

The defense program is nearing its point of greatest impact on the economy. Actual output of military goods isn't expected to hit its full stride until the latter part of next year. But, because of lead time necessary for both material and parts, the steel take for defense will be very high in the first quarter of 1952—it will probably reach its peak about mid-year. After that, it is expected to level off for a time, then slowly decline.

To meet the needs of the defense program and the Controlled Materials Plan steel people have had to alter their product mix (the types and quantities of steel items they make). Some steel items which were in tightest supply before Korea are now relatively easier. On many other items the reverse is true.

Changing Market — For example, before Korea cold-rolled sheets and strip were about the tightest items in the steel market. During the previous 5 years such light gage flat-rolled products accounted for roughly one-third of total finished steel output. Principal consumers were consumer durable goods industries including autos and appliances.

Now production cutbacks have so throttled their demand that sheet tonnage offered by conversion brokers is going begging. One flat-rolled producer is having trouble locating customers willing to buy rejects, seconds and wasters.

Part of Plan—Actually, it's all part of the plan—to produce less thin flat-rolled products and more plates, shapes and bars. Much of the needed expansion in plate output is being obtained by assigning light plate orders to continuous hot-strip mills. Space is made available by curbing demand for sheets and strip.

Quickly increasing output of structural shapes and bars is more difficult. Structural and bar mill equipment is not as flexible as plate and strip mills. These products, along with some stainless and alloy items, will be the bottlenecks until defense needs are met.

Wildcats—The "softening up" process leading to steel wage negotiations is well under way. During the past month wildcat strikes have hit production in four important steel producing districts —Pittsburgh, Youngstown, Chicago and the South.

Steel losses resulting from these strikes haven't loomed large compared with enormous total industry output. For one thing, strikes have been isolated. And most of them have been short. But tonnage lost from these strikes is gone forever—it can't be made up at a later date. And production facilities are disrupted sometimes for days or even weeks after workers return to their jobs.

Causes Vague—Such softening up tactics on the part of steel workers are not uncommon—are rather to be expected, in view of past experience. But they don't reflect any established policy of the United Steelworkers of America (CIO). Labor relations people in the industry regard them as an indication of labor's restlessness over wage negotiations soon to begin. The fact that so-called causes of these strikes are usually hazy and ill-defined seems to bear them out.

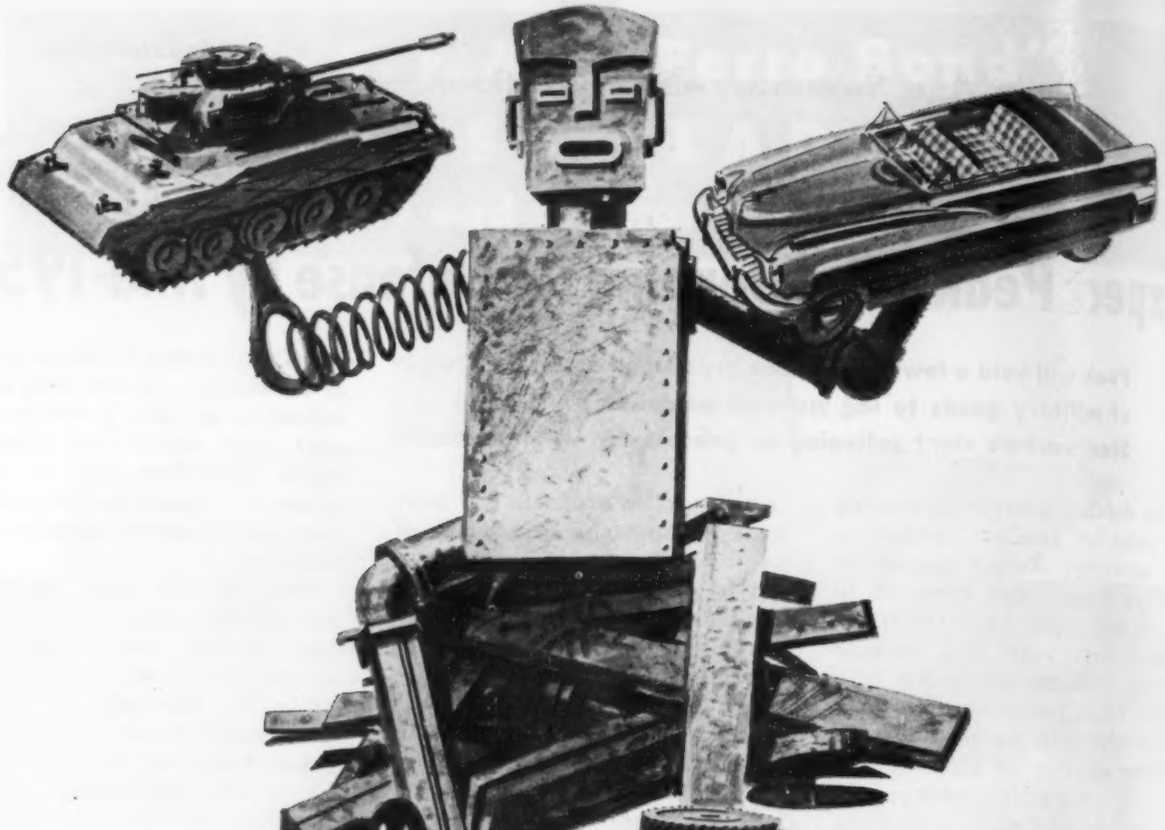
Steel labor's wage campaign will officially open Nov. 14, when their 33-man International Executive Board will meet at Atlantic City. They will outline and recommend formal contract demands. These will be passed on by the union's 163-member International Wage Policy Committee meeting at the same place Nov. 15 and 16. The negotiators will pick it up from there.

Steel Price Control—In Washington, Office of Price Stabilization officials are racing to complete a list of tailored price controls on steel mill products before wage negotiations get in full swing. Chances are they will lose the race.

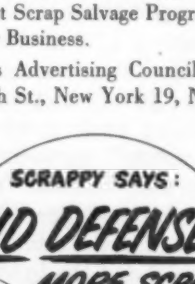
This is only one phase of a broad OPS program of emphasizing specific dollars-and-cents ceilings for manufactured items. Outlook is that premium-priced producers will still be allowed to charge more than the bulk of the industry.

Tight Lid—Steel producers are still selling their products under a "voluntary" agreement not to raise prices without giving the government advance notice. Even controls officials admit that this has been one of the brightest spots in the price control picture so far. But any increase in steel wages will blow off the price lid.

Steelmaking operations this week are scheduled at 102.5 pct of rated capacity, up 1.5 points from last week's revised rate.



How Can America Produce All the Steel It Needs . . . for Military . . . and Civilian Purposes?



FREE BOOKLET Tells How to Conduct Scrap Salvage Program in *Your* Business.

Address Advertising Council, 25 W. 45th St., New York 19, N. Y.

One way is to feed more pig iron into the furnaces. But . . .

That will require *more* supplies of ore, limestone, coal, etc.*—to say nothing of more new ore boats and rail cars to transport the additional supplies.

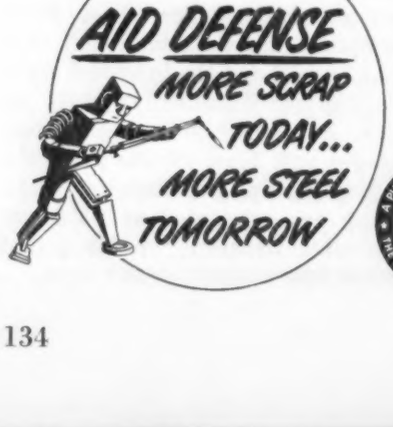
A better way—the *only* practical way—is to use the *dormant* iron and steel scrap lying around in the form of old machines, equipment, tools and metal structures.

Your business *must* have available scrap—in *some* form. That scrap is *needed* to keep the furnaces going in the steel mills . . . to keep our fighting forces and our allies well armed . . . to sustain our civilian life at home.

Think how many ways *you* use iron and steel. Think what would happen if it became extremely scarce. Put your iron and steel scrap to good use—now—by selling it to your local scrap dealer.

Don't delay—the emergency is becoming more severe every day.

*For every ton of scrap fed into the furnaces, we save approximately 2 tons of iron ore, 1 ton of coal, nearly ½ ton of limestone and many other critical materials. Also, scrap helps make steel faster, shortens the refining process.



A PUBLIC SERVICE PROJECT
THE ADVERTISING COUNCIL

NON-FERROUS SCRAP IS NEEDED, TOO!

This advertisement is a contribution, in the national interest, by

The **Iron Age**

Market Briefs

outstanding orders—Deadline of Oct. 31 has been set by National Production Authority for bringing outstanding orders for steel, copper and aluminum into line with fourth quarter allotments. Amended directions require cancellation or adjustment of outstanding orders not later than Oct. 31 to allow for shipments after Oct. 7 of materials ordered against third quarter allotments.

aluminum duty—Cancellation of all import duties on aluminum is sought in Washington by Rep. Emanuel Celler, D., N. Y. Aluminum tariff recently was cut from 4¢ to 1½¢ per lb. Celler says the duty should be dropped entirely, at least temporarily, because about 17,000 fabricators are in "sore distress."

sands of India—Indian Government geologists report that deposits of ilmenite sands found in Bombay State contain a large percentage of titanium. Exploitation is to start immediately. The production of titanium is not possible in India at present, but the separation of the ilmenite from the sands will be undertaken.

rate rise—Freight rates on iron and steel products have increased 78.2 pct since June 30, 1946, according to new Interstate Commerce Commission estimates. Rates on iron ore rose by only 38.4 pct in the same period. Average rate rise for all products is 67.1 pct.

Army awards—Approximately $7,600,000 in Army Ordnance contracts were awarded in the Chicago Ordnance District last week, awards going to 22 organizations in Illinois, Wisconsin and Indiana. Included were three classified contracts for undisclosed items.

strike—The electric furnace shop of Crucible Steel Co. at Midland, Pa., was strike-bound last weekend. Ingot production loss was approximately 2000 tons. The strike was settled Monday. Some 140 workers were directly involved in a dispute over job descriptions.

high vacuum—Factory sales of standard size household vacuum cleaners in September totaled 210,086 units, according to the Vacuum Cleaner Mfr's. Assn. This was an advance of 9.8 pct over August, but a drop of 35.9 pct from September, 1950, sales.

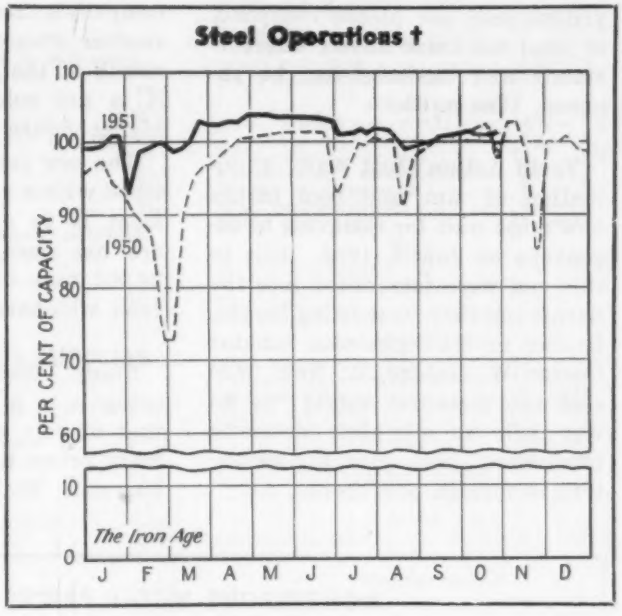
earnings—Average August hourly payments to wage earners in the iron and steel industry was $1.931, not $1.391 as reported on this page Oct. 18.

combat mines—About 200 tons of tungsten ore per month are being supplied to U. S. by Republic of Korea. Army says U. S. is only nation obtaining Korean tungsten, some of it mined in combat areas. In a number of instances, the material is being dug under the surveillance of UN security troops, stationed to protect miners from guerilla action.

tax rise—Federal revenues are scheduled to increase about $5,691,000,000 annually under the new tax bill. Law calls for an increase of 11.75 pct for most taxpayers, effective Nov. 1. Corporation taxes are increased from 47 pct to 52 pct. Excess profits tax is revised to bring in about $100,000,000 annually in new revenue.

relief needed—Producers of high-temperature alloys and tool steels containing cobalt are asking OPS for higher prices to compensate for the 30¢ per lb rise in cobalt prices on Oct. 1. Some alloys contain as much as 40 pct cobalt.

locomotive orders—September orders for new locomotives passed any other month on record, according to Assn. of American Railroads. Of 459 locomotives ordered, 444 were diesel-electric and 15 steam. Total orders for new locomotives so far this year stand at 1827.



District Operating Rates—Per Cent of Capacity †

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	West	Buffalo	Cleveland	Detroit	Wheeling	South	Ohio River	St. Louis	East	Aggregate
Oct. 14	103.0*	96.0*	96.0*	101.0	104.0	104.0	98.5	105.0*	105.0*	104.0	97.5*	98.0	90.0	101.0*
Oct. 21	100.0	102.5	104.0	101.0	103.0	104.0	100.5	106.0	105.0	104.0	99.0	104.0	103.0	102.5

† Beginning Jan. 1, 1951, operations are based on annual capacity of 104,229,650 net tons.
* Revised.

Issue Zinc, Lead Scrap Orders

Action taken Monday . . . Expect end product order soon . . . Zinc, lead tariff suspension tabled until Congress reconvenes . . . May up nickel scrap prices—*By R. L. Hatschek.*

Zinc and lead scrap may now be expected to move. They have barely trickled since Oct. 2 when primary metal prices were raised 2¢ but Office of Price Stabilization issued several amendments on Monday which were designed to bring the prices back into better alignment.

An order permitting higher prices for end products to compensate for increased lead, zinc costs is expected later this week, says OPS.

Lead scrap, secondary lead and antimonial lead were revised 2¢ per lb upward while remelt zinc went up 2¢, unsweated zinc dross and die cast slabs went up 1½¢, and all other zinc scrap grades got a 1¢ per lb boost. While these revisions may not please everyone, at least the trade knows where it stands and business can be resumed. (See p. 63.)

Tariff Action Must Wait—Elimination of zinc and lead tariffs now must wait for Congress to reconvene on Jan. 8, 1952. Bills to this end were introduced into the Senate but they were being fought. Leader in the fight was Senator George W. Malone, R., Nev., who said the measures would "in no way help to stimulate domestic production" and give an advantage to foreign producers.

The bills were patterned after the copper tariff suspension and make reimposition of the tariffs mandatory whenever the prices fall below specified levels, 18¢ per lb in the case of lead. Others supported the measures as methods of alleviating the current shortages.

Zinc Expansion—A new $450,000 zinc concentrating plant is to be built at Monterrey, Mexico, by National Zinc Co. under the terms of an agreement with the government. Defense Materials Procurement Agency has guaranteed a 16½¢ per lb price for 20,000 tons of slab zinc from the new plant.

The slab is to come from the company's Bartlesville, Okla., smelter at a rate of 600 tons a month at the guaranteed price if it is not sold to industry at a higher figure.

The new facilities are to be finished within a year and the agreement is to expire when enough ore has been processed for the 20,000 tons of zinc, or in Aug., 1956, whichever is sooner.

Study Nickel Prices—Nickel scrap is in a situation similar to that of zinc and lead where primary prices have risen and scrap has not. Nickel prices went up 6½¢ per lb, stretching the spread from 10¢ to 16½¢ and industry has been reminding OPS of this fact. The agency is now reported to be studying the situation.

OPS has also been asked to raise the converter's premium on some scrap, now at 2½¢ per lb.

Regulate Anodes—Nickel anodes and possibly nickel salts are being considered for a separate pricing regulation. The point of this order would be to eliminate the conditions which made possible the nickel black market which was brought to light by the recent Senate subcommittee investigation. Industry's gripe has been that anode prices are in a distorted relationship with primary prices.

Trust Busters—As mentioned in this column last week, Washington is worried about giving more aluminum capacity to the "big three." Justice Dept. is preparing to recommend that no further government assistance be given to Aluminum Co. of America, Reynolds Metals Co., and Kaiser Aluminum & Chemical Co.

Justice Dept. believes that special consideration should be given to proposals by independent firms wishing to get into the primary aluminum field. It is presumed that this special consideration take the form of subsidies. But DMPA is under heavy pressure to take any steps necessary to increase capacity and some officials believe that the best way is by negotiating with Alcoa, Reynolds and Kaiser.

Aluminum Output—Primary aluminum production in August was 73,815 tons, an increase of 1100 tons over July. Production then dropped because of the Northwest power shortage but with a total of 550,104 tons for the first 8 months of the year it is still a safe bet that the year's total will exceed 800,000 tons.

NONFERROUS METAL PRICES

	Oct. 17	Oct. 18	Oct. 19	Oct. 20	Oct. 22	Oct. 23
Copper, electro, Conn.	24.50	24.50	24.50	24.50	24.50	24.50
Copper, Lake delivered	24.625	24.625	24.625	24.625	24.625	24.625
Tin, Straits, New York	$1.03	$1.03	$1.03	....	$1.03	$1.03*
Zinc, East St. Louis	19.50	19.50	19.50	19.50	19.50	19.50
Lead, St. Louis	18.80	18.80	18.80	18.80	18.80	18.80

*Tentative

Note: Quotations are going prices.

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.188 in., 2S, 3S, 30.1¢; 4S, 52S-O, 32¢; 52S, 34.1¢; 24S-O, 24S-OAL, 32.9¢; 61S-O, 75S-OAL, 39.9¢; 0.081 in., 2S, 3S, 31.2¢; 61S-O, 33.5¢; 52S, 35.6¢; 24S-O, 24S-OAL, 34¢; 75S-O, 75S-OAL, 41.8¢; 0.032 in., 2S, 3S, 32¢; 4S, 61S-O, 37.1¢; 52S, 39.8¢; 24S-O, 24S-OAL, 41.7¢; 75S-O, 75S-OAL, 52.2¢.

Plate ¼ in. and heavier: 2S, 3S-F, 28.3¢; 4S-F, 30.2¢; 52S-F, 31.8¢; 61S-O, 30.8¢; 24S-O, 24S-OAL, 32.4¢; 75S-O, 75S-OAL, 38.8¢.

Extruded Solid Shapes: Shape factors 1 to 5, 32¢ to 74.5¢; 12 to 14, 36.9¢ to 89¢; 24 to 28, 38.6¢ to $1.16; 36 to 38, 47.2¢ to $1.70.

Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 37.5¢; 33.5¢; cold finished, 0.375 to 3 in., 2S-F, 3S-F, 40.5¢ to 35¢.

Screw Machine Stock: Rounds, 11S-T3, ⅛ to 11/32 in., 53.5¢ to 42¢; ⅜ to 1½ in., 41.5¢ to 39¢; 1 9/16 to 3 in., 38.5¢ to 36¢; 17S-T4 higher by 1.5¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in., 2S, 45¢ to 29¢; 52S, 48¢ to 35¢; 56S, 51¢ to 37¢; 17S-T4, 54¢ to 37.5¢; 61S-T4, 48.5¢ to 34¢; 75S-T6, 84¢ to 67.5¢.

Extruded Tubing, Rounds: 63-S-T-5, OD in in.: 1-¼ to 2, 37¢ to 54¢; 2 to 4, 33.5¢ to 45.5¢; 4 to 6, 34¢ to 41.5¢; 6 to 9, 34.5¢ to 43.5¢.

Roofing Sheet, Flat: 0.019 in. x 28 in. per sheet, 72 in., $1.42; 96 in., $1.522; 120 in., $1.902; 144 in., $2.284. Gage 0.24 x 28 in., 72 in., $1.379; 96 in., $1.839; 120 in., $2.299; 144 in., $2.759. Coiled Sheet: 0.019 in. x 28 in., 30.2¢ per lb; 0.024 in. x 28 in., 26.9¢ lb.

Magnesium

(F.O.B. mill, freight allowed)

Sheet and Plate: FS1-O, ¼ in., 63¢; 3/16 in. 69¢; ⅛ in. 67¢; B & S Gage 10, 69¢; 12, 72¢; 14, 78¢; 16, 85¢; 18, 93¢; 20, $1.05; 22, $1.27; 24, $1.67. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., ¼ to 0.311 in., 74¢; ⅓ to ¾ in., 57.5¢; 1¼ to 1.749 in., 53¢; 2½ to 5 in., 48.5¢. Other alloys higher. Base Up to ¾ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated, 0.10 to 0.11 lb, 3.5 in., 62.3¢; 0.22 to 0.25 lb, 5.9 in., 59.3¢; 0.50 to 0.59 lb, 8.6 in., 56.7¢; 1.8 to 2.59 lb, 19.5 in., 53.8¢; 4 to 4.5 lb, 28 in., 49¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb, ½ to 1.80 lb, 20,000 lb; 1.80 and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ in. to 5/16, $1.40; 5/16 to ⅜, $1.26; ½ to ⅝, 93¢; ¾ to 2 in., 76¢; 0.165 to 0.219, ⅝ to ¾, 84¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in in.: Up to 1½ in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $10; Bar, HR or forged, $6; Forgings, $6.

Nickel and Monel

(Base prices, f.o.b., mill)

	"A" Nickel	Monel
Sheets, cold-rolled	77	60½
Strip, cold-rolled	83	63½
Rods and bars	73	58½
Angles, hot-rolled	73	58½
Plates	75	59½
Seamless tubes	106	93½
Shot and blocks	..	53½

Copper, Brass, Bronze

(Freight prepaid on 200 lb)

	Sheet	Rods	Extruded Shapes
Copper	41.68	....	41.28
Copper, h-r	....	37.53	....
Copper, drawn	....	38.78	....
Low brass	39.67	39.36	....
Yellow brass	38.28	37.97	....
Red brass	40.14	39.83	....
Naval brass	43.20	37.26	38.52
Leaded copper	....	41.58	....
Com'l bronze	41.13	40.82	....
Mang. bronze	46.92	40.81	42.37
Phos. bronze	61.07	61.32	....
Muntz metal	41.18	36.74	37.99
Ni silver, 10 pct	49.82	52.04	....

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	19.00
Aluminum pig	18.00
Antimony, American, Laredo, Tex.	42.00
Beryllium copper, 3.75-4.25% Be	$1.56
Beryllium aluminum 5% Be, Dollars per lb contained Be	$69.00
Bismuth, ton lots	$2.25
Cadmium, del'd	$2.55
Cobalt, 97-99% (per lb)	$2.40 to $2.47
Copper, electro, Conn. Valley	24.50
Copper, Lake, delivered	24.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$200
Lead, St. Louis	18.80
Lead, New York	19.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb	24.50
Magnesium, sticks, 100 to 500 lb	42.00 to 44.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$220-$222
Nickel electro, f.o.b. N. Y. warehouse	59.58
Nickel oxide sinter, at Copper Cliff, Ont., contained nickel	52.75
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$90 to $93
Silver, New York, cents per oz.	88.00
Tin, New York	$1.03
Titanium, sponge	$5.00
Zinc, East St. Louis	19.50
Zinc, New York	20.29
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb, delivered carloads)

85-5-5-5 ingot	
No. 115	27.25
No. 120	26.75
No. 123	26.25
80-10-10 ingot	
No. 305	32.25
No. 315	30.25
88-10-2 ingot	
No. 210	40.00
No. 215	38.50
No. 245	33.50
Yellow ingot	
No. 405	23.25
Manganese bronze	
No. 421	29.50

Aluminum Ingot

(Cents per lb, 10,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	20.6
0.60 copper, max.	20.4
Piston alloys (No. 122 type)	21.2
No. 12 alum. (No. 2 grade)	19.5
108 alloy	20.6
195 alloy	20.8
13 alloy	20.8
ASX-679	20.5

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	18.00
Grade 2—92-95%	17.75
Grade 3—90-92%	17.25
Grade 4—85-90%	16.50

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	37.84
Electrodeposited	33⅜
Flat rolled	38.34
Forged ball anodes	43
Brass, 80-20	
Cast, oval, 15 in. or longer	34¾
Zinc, oval	26½
Ball anodes	25½
Nickel 99 pct plus	
Cast	76.00
Rolled, depolarized	77.00
Cadmium	$2.80
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	97½

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	20½
Nickel chloride, 375 lb drum	27½
Silver cyanide, 100 oz lots, per oz.	67¼
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drum	47.7

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	21½	20¾
Yellow Brass	19½	17⅞
Red brass	20½	19⅝
Comm. bronze	20½	19¾
Mang. bronze	18½	17¾
Brass rod ends	18⅞	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
Refinery brass	17.25*
Radiators	14.75

* Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
No. 1 composition	18.50
No. 1 comp. turnings	18.25
Rolled brass	16.50
Brass pipe	16.50
Radiators	14.75
Aluminum	
Mixed old cast	9.75
Mixed new clips	11.00
Mixed turnings, dry	9.50
Pots and pans	9.25

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	18¾—19¼
No. 2 heavy copper and wire	17¼—17¾
Light copper	16 —16½
New type shell cuttings	16 —16½
Auto radiators (unsweated)	14¼—14¾
No. 1 composition	18 —18½
No. 1 composition turnings	17¾—18
Unlined red car boxes	16¾—17¼
Cocks and faucets	15½—16
Mixed heavy yellow brass	12 —12½
Old rolled brass	15 —15½
Brass pipe	16 —16½
New soft brass clippings	16 —16½
Brass rod ends	15½—16
No. 1 brass rod turnings	15 —15½

Aluminum

Alum. pistons and struts	6½— 7½
Aluminum crankcases	7½— 8
2S aluminum clippings	10½
Old sheet and utensils	7½— 8
Borings and turnings	5 — 6
Misc. cast aluminum	7½— 8
Dural clips (24S)	10 —11

Zinc

New zinc clippings	13¼—13½
Old zinc	10 —10¼
Zinc routings	6¾— 7
Old die cast scrap	6¾— 7

Nickel and Monel

Pure nickel clippings	35 —36
Clean nickel turnings	35 —36
Nickel anodes	35 —36
Nickel rod ends	35 —36
New Monel clippings	28 —29
Clean Monel turnings	20 —21
Old sheet Monel	28 —29
Nickel silver clippings, mixed	13 —14
Nickel silver turnings, mixed	12 —13

Lead

Soft scrap, lead	16 —16½
Battery plates (dry)	10½—11

Magnesium

Segregated solids	15 —16
Castings	14 —15

Miscellaneous

Block tin	85 —90
No. 1 pewter	60 —65
No. 1 auto babbitt	48 —50
Mixed common babbitt	16¼—16½
Solder joints	23 —24
Siphon tops	48 —50
Small foundry type	20½—21
Monotype	18¼—18½
Lino. and stereotype	17½—18
Electrotype	15 —15½
Hand picked type shells	8¾— 9
Lino. and stereo. dross	8¾— 9
Electro. dross	5 — 5¼

OPS Heard From; Issues Scrap Order

Agency pushed out of sidelines into game . . . Amendment puts single price of $43, Pittsburgh, on No. 1, No. 2, No. 2 bundles . . . No. 1 bundles on top . . . Foundry steel price cut.

At the indignant insistence of both scrap and steel industries that passive observer, Office of Price Stabilization, has been pried out of its sideline seat into the game. Last Tuesday, it belatedly issued a scrap pricing amendment (Amend. 5, CPR 5) recognizing that new rules were needed for shortage times. The order is effective Oct. 30 or any earlier date between Oct. 23 and Oct. 30.

A single price of $43 per ton, Pittsburgh basing point, was established for No. 1 heavy melting (down $1), No. 2 heavy (up $1), and No. 2 bundles (up $2). No. 1 bundles was made the prime grade at its previous price of $44 per ton, Pittsburgh. The traditional bellwether grade, No. 1 heavy, had vanished from the market as such but could usually be found popping up in more attractive grade listings.

Differentials for foundry steel have been lowered $2 a ton in an effort by OPS to discourage upgrading of heavy melting grades into these more profitable categories. This is not sudden death to upgrading—but the profit margins have been whittled down.

Real benefit of the order will come when dealers can merge the three grades for rail or barge shipment. Time-consuming segregation of grades will be done away with. Also, raising the ceiling price for unprepared steel scrap going into No. 2 bundles gives peddlers, auto wreckers, and other producers of non-production scrap a chance to make ends meet.

The new amendment also sets ceiling prices for all sales and deliveries of scrap. That blankets everyone now — including interdealer sales previously exempt. Trucking charges can be applied only on shipments of prepared scrap.

This merger of three openhearth grades will be futile in halting upgrading unless OPS follows through with concrete enforcement action. Thus far OPS enforcement has been largely invisible. Mere issuance of orders cannot stabilize the market, some scrap men say.

Pittsburgh—The trade this week finally won an OPS amendment combining openhearth grades. Simultaneously, OPS is expected to announce that up to 200 inspectors will be sent into the field to police grading standards. Inventory position of some mills here is deteriorating. A Valley mill late last week was operating out of railroad cars of scrap shipped from a Midwestern sister plant.

Chicago—The trade was breathing a little easier at recent issuance of an OPS order merging some openhearth grades. Declining civilian output is worrying some scrap men. Hope is that winter will be a mild one to permit reasonable flow of scrap.

Philadelphia—The situation here is getting rougher and rougher with mills operating on a truck-to-charging-box basis. And they're still keeping their gates open on Saturday for truck shipments. Last week's modification to the scrap order has made little difference.

New York—Dealers here have not been holding back much already scarce material in anticipation of a better break through the recent OPS order merging openhearth grades. Some scrap men feel that OPS enforcement is the only means to a stabilized market. Mere orders won't help much.

Detroit — In the face of declining civilian production and the present low volume of defense production, Detroit scrap sources will have to lean more heavily than ever on local scrap drives and pickups from remote areas. At the moment, Detroit mills are able to meet their melting schedules but the possibility of a severe shortage this winter is still a cause for much speculation.

Cleveland—Dealers here and in the Valley report a falling of dormant and industrial scrap grades collections. Some say more industrial scrap is going directly to mills. Rail scrap is not plentiful but is holding up. Auto wreckers may install scrap processing equipment to sell directly to mills. Wreckers are now paying up to $35 per car wreck rather than $30 and because of OPS restrictions feel justified in selling directly to mills.

St. Louis—Considerable scrap iron continued to be held up on rumors that OPS would merge melting grades at a single price. Railroads are doing more track work, removing old rail for new, easing the old rails market. More locomotives are being dismantled. Mills here have consumed more scrap than received during the first half of October.

Birmingham — Movement of openhearth grades of scrap in this area was almost at a standstill in expectation of the OPS order equalizing openhearth grades. Some cast continues to come into the district, but only enough to meet immediate demands.

Cincinnati — Recent amendment of marriage of openhearth grades was keeping dealers on edge and has slowed scrap traffic in these grades. Greater push now being put on auto wreckers for scrap to dealers. Brokers setting up renewed effort to keep this scrap moving. Cast grades still easy but founders are becoming more choosy. South of Cincinnati cast grades are easier than they have been.

Boston — Strong demand for all forms of scrap continues. Demand is good for cast but buyers are much stricter in applying certain specifications.

Buffalo—Dealers are keeping up a steady scrap flow to mills, meeting their current needs. Fears grow that allocations may take material out of the district. Cast turned softer. Stocks are ample. Scrap drives are going in the western New York area. Water shipments are not as heavy as expected.

Official Navy photo, released by Dept. of Defense

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Iron and Steel

SCRAP PRICES

(Maximum basing point prices, per gross ton, as set by OPS, effective Feb. 7, 1951. Shipping point and delivered prices calculated as shown below.)

Switching Charge (Dollars per gross ton) →		$0.99	.75	.63	.65	.75	.51	.75	.75	.51	.51	.75	.70	.78	.83	.65	.26	1.34	.75	.50	.20	.51	.51	.20	.32	.47	.51	.51	.51	.95	.50	.78	.50	.43	.51	.33	.57	.57	.57	.57	.57
Basing Points →		Pittsburgh	Johnstown	Brackenridge	Butler	Midland	Monessen	Sharon	Youngstown	Canton	Steubenville	Warren	Wellsville	Cleveland	Buffalo	Cincinnati	Middletown	Chicago	Claymont	Coatesville	Conshohocken	Harrisburg	Phoenixville	Sparrows Pt.	Bethlehem	Ashland, Ky.	Kokomo, Ind.	Portsmouth, O.	St. Louis	Detroit	Duluth	Kansas City	Birmingham	Alabama City	Atlanta	Minneapolis	Houston	Los Angeles	Pittsburg, Cal.	Portland, Ore.	San Francisco	Seattle
GRADES	OPS No.																																								
No. 1 bundles	4	$44.00						$44.00						$43.00				$42.50						$42.00					$41.00	$41.15	$40.00	$39.50	$39.00		$38.00	$37.00	$36.00				
No. 1 heavy melting	1	43.00						43.00						42.00				41.50						41.00					40.00	40.15	39.00	38.50	38.00		37.00	36.00	34.00				
No. 2 heavy melting	2	43.00						43.00						42.00				41.50						41.00					40.00	40.15	39.00	38.50	38.00		37.00	36.00	34.00				
No. 2 bundles	5	43.00						43.00						42.00				41.50						41.00					40.00	40.15	39.00	38.50	38.00		37.00	36.00	34.00				
No. 1 busheling	3	44.00						44.00						43.00				42.50						42.00					41.00	41.15	40.00	39.50	39.00		38.00	37.00	35.00				
Machine shop turnings	6	34.00						34.00						33.00				32.50						32.00					31.00	31.15	30.00	29.50	29.00		28.00	27.00	25.00				
Mixed borings and turnings	7	38.00						38.00						37.00				36.50						36.00					35.00	35.15	34.00	33.50	33.00		32.00	31.00	29.00				
Shovelling turnings	8	38.00						38.00						37.00				36.50						36.00					35.00	35.15	34.00	33.50	33.00		32.00	31.00	29.00				
Cast iron borings	10	38.00						38.00						37.00				36.50						36.00					35.00	35.15	34.00	33.50	33.00		32.00	31.00	29.00				
No. 1 chemical borings	26	41.00						41.00						40.00				39.50						39.00					38.00	38.15	37.00	36.50	36.00		35.00	34.00	32.00				
Forge crops	11	51.50						51.50						50.50				50.00						49.50					48.50	48.65	47.50	47.00	46.50		45.50	44.50	42.00				
Bar crops and plate	12	49.00						49.00						48.00				47.50						47.00					46.00	46.15	45.00	44.50	44.00		43.00	42.00	40.00				
Punchings and plate	14	46.50						46.50						45.50				45.00						44.50					43.50	43.65	42.50	42.00	41.50		40.50	39.50	37.00				
Electric furnace bundles	15	46.00						46.00						45.00				44.50						44.00					43.00	43.15	42.00	41.50	41.00		40.00	39.00	37.00				
Cut struct., plate, 3 ft and less	16	47.00						47.00						46.00				45.50						45.00					44.00	44.15	43.00	42.50	42.00		41.00	40.00	38.00				
Cut struct., plate, 2 ft and less	17	49.00						49.00						48.00				47.50						47.00					46.00	46.15	45.00	44.50	44.00		43.00	42.00	40.00				
Cut struct., plate, 1 ft and less	18	50.00						50.00						49.00				48.50						48.00					47.00	47.15	46.00	45.50	45.00		44.00	43.00	41.00				
Foundry steel, 2 ft and less	20	44.00						44.00						43.00				42.50						42.00					41.00	41.15	40.00	39.50	39.00		38.00	37.00	35.00				
Foundry steel, 1 ft and less	21	46.00						46.00						45.00				44.50						44.00					43.00	43.15	42.00	41.50	41.00		40.00	39.00	37.00				
Heavy trimmings	24	43.00						43.00						42.00				41.50						41.00					40.00	40.15	39.00	38.50	38.00		37.00	36.00	34.00				
Hard steel, 2 ft and less	30	49.00						49.00						48.00				47.50						47.00					45.00	46.15	45.00	44.50	44.00		43.00	42.00	40.00				
No. 1 RR heavy melting	RR 1	46.00						46.00						45.00				44.50						44.00					43.00	43.15	42.00	41.50	41.00		40.00	39.00	37.00				
Scrap rails, random lengths	RR 14	48.00						48.00						47.00				46.50						46.00					45.00	45.15	44.00	43.50	43.00		42.00	41.00	39.00				
Scrap rails, 3 ft and less	RR 16	51.00						51.00						50.00				49.50						49.00					48.00	48.15	47.00	46.50	46.00		45.00	44.00	42.00				
Scrap rails, 2 ft and less	RR 17	52.00						52.00						51.00				50.50						50.00					49.00	49.15	48.00	47.50	47.00		46.00	45.00	43.00				
Scrap rails, 18 in. and less	RR 18	54.00						54.00						53.00				52.50						52.00					51.00	51.15	50.00	49.50	49.00		48.00	47.00	45.00				
Rerolling rails	RR 15	53.00						53.00						52.00				51.50						51.00					50.00	50.15	49.00	48.50	48.00		47.00	46.00	44.00				
Uncut tires	RR 20	48.00						48.00						47.00				46.50						46.00					45.00	45.15	44.00	43.50	43.00		42.00	41.00	39.00				
Cut tires	RR 21	51.00						51.00						50.00				49.50						49.00					48.00	48.15	47.00	46.50	46.00		45.00	44.00	42.00				
Cut bolsters and side frames	RR 23	49.00						49.00						48.00				47.50						47.00					46.00	46.15	45.00	44.50	44.00		43.00	42.00	40.00				
RR specialties	RR 24, 28, 29	51.00						51.00						50.00				49.50						49.00					48.00	48.15	47.00	46.50	46.00		45.00	44.00	42.00				
Solid steel axles	RR 25	58.00						58.00						57.00				56.50						56.00					55.00	55.15	54.00	53.50	53.00		52.00	51.00	49.00				
No. 3 steel wheels	RR 27	51.00						51.00						50.00				49.50						49.00					48.00	48.15	47.00	46.50	46.00		45.00	44.00	42.00				
Unassorted	RR 35	40.00						40.00						39.00				38.50						38.00					37.00	37.15	36.00	35.50	35.00		34.00	33.00	31.00				

Cast Scrap

(F.o.b. all shipping points)

Grades	OPS No.	
Cupola cast	1	$49.00
Charging box cast	2	47.00
Heavy breakable cast	3	45.00
Cast iron brake shoes	5	41.00
Stove plate	6	46.00
Clean auto cast	7	52.00
Unstripped motor blocks	8	43.00
Cast iron carwheels	9	47.00
Malleable	10	55.00
Drop broken mach'y cast	11	52.00

Ceiling price of clean cast iron foundry runouts or prepared cupola drops is 75 pct of corresponding grade.

SWITCHING DISTRICTS—These basing points include the indicated switching districts: Pittsburgh; Bessemer, Homestead, Duquesne, Munhall. Cincinnati; Newport. St. Louis; Granite City, East St. Louis, Madison, and Federal, Ill. San Francisco; South San Francisco, Niles, Oakland. Claymont; Chester. Chicago; Gary.

SHIPPING POINT PRICES (Except RR scrap)—for shipping points within basing points, the ceiling shipping point price is the basing point price, less switching charge. The ceiling for shipping points outside basing points is the basing point price yielding the highest shipping point price, less the lowest established freight charge. Dock charge, where applicable, is $1.25 per gross ton except: Memphis, 95¢; Great Lakes ports, $1.50, and New England ports, $1.75. Maximum shipping point price on No. 1 bundles (prime grade) in New York City is $36.99 per gross ton with set differentials for other grades. Hudson and Bergen County, N. J., shipping point prices are computed from Bethlehem basing point. All New Jersey computations use all-rail transport. Cast scrap shipping point prices are given in table.

DELIVERED PRICES (RR scrap) — Ceiling on-line price of a RR operating in a basing point is the top in the highest priced basing point in which the RR operates. For off-line prices, RR's not operating in basing point non-operating RR's, and RR scrap sold by someone other than a RR see text of order, THE IRON AGE, Feb. 8, 1951, p. 137-C and amend 4, CPR 5.

DELIVERED PRICES (Except RR scrap)—Ceiling is the shipping point price plus actual freight charge, tax included. Dock charges, where applicable, are as above.

UNPREPARED SCRAP—Ceiling price is $8 a ton less than prepared base grades (No. 1 heavy & No. 1 RR heavy). Scrap suitable for compressing into No. 1 bundles is $6 less than No. 1 bundles; suitable for compressing into No. 2 bundles, $8 less than No. 2 bundles. For cast material requiring special preparation, price is breakable cast less preparation costs.

COMMISSIONS—Brokers are permitted a maximum of $1 per gross ton commission which must be separate on the bill.

ALLOY PREMIUMS—These alloy extras are permitted: **Nickel**; $1.25 may be added to price of No. 1 heavy for each 0.25 pct nickel between 1 and 5.25 pct. **Molybdenum**; $2 may be added to price of No. 1 heavy for moiybdenum over 0.15 pct, $3 for content over 0.65 pct. **Manganese**; $4 may be added to price of No. 1 heavy or No. 1 RR heavy for content over 10 pct if scrap is in sizes over 8 x 12 x 24 in., $14 if less than 8 x 12 x 24 in. Manganese premium applicable only if sold for electric furnace use or on NPA allocation. **Silicon**: electric furnace and foundry grade adjustments are not applicable if silicon content is between 0.5 and 1.75 pct. **Chromium**; $1 may be added if scrap conforms to SAE 52100 analysis. **Multiple Alloys**; if scrap contains two premium alloy elements, total premium may not exceed ceiling premium for any one contained alloy.

RESTRICTIONS ON USE — Ceiling prices on some scrap items may fluctuate with use by consumers. If some scrap is purchased for its established specialized use, the ceiling price set in the order stands. But if some special grades are purchased for other uses, the ceiling price charge shall be the price of the scrap grade being substituted. For example, the price established for Grade 28 (wrought iron) may be charged only when sold to a producer of wrought iron. Otherwise the ceiling price shall not exceed the ceiling price for the corresponding grade of basic openhearth. Restrictions on use are placed on the following grades: Chemical borings, wrought iron and rerolling rails, cupola cast, billet, bloom, and forge crops, Nos. 1 and 2 chemical borings. Ceiling prices on billet bloom and forge crops, alloy-free turnings, and heavy turnings may be charged only when shipped directly from industrial producer. NPA prohibits openhearth users from buying electric furnace grades, Nos. 11 through 18, foundry grades, Nos. 20 and 21 and cast grades, 1, 7, 9 and 11.

CEILING INTRANSIT PREPARATION CHARGES (Dollars per gross ton)

No. 1 heavy; No. 2 heavy; No. 1 RR heavy; No. 2 RR heavy; No. 1 busheling; No. 2 bundles; electric furnace bundles	$ 8.00
No. 1 bundles; briquetted turnings or cast iron borings; No. 1 RR sheet scrap	6.00
Crushing machine shop turnings	3.00
Bar crops and plate, cast steel, punchings and plate, cut structural and plate, 3 ft and under, foundry steel, 2 ft and under, wrought iron	10.00
Structural, plate scrap, 2 ft and less, foundry steel 1 ft and less	11.00
Structural and plate scrap, 1 ft and less	12.00
Rails, 3 ft & less; cut tires; cut bolsters & side frames	4.00
Rails, 2 ft & less	5.00
Rails, 18 in. & less	7.00

Hamilton, Ontario

(Consumers buying prices, del'd gross ton)

Hvy. melting steel	$35.00
No. 1 bundles	35.00
No. 2 bundles	34.50
Mechanical bundles	33.00
Mixed, steel scrap	31.00
Rails, remelting	35.00
Rails, rerolling	36.00
Bushelings	29.50
Bushelings, prepared new factory	33.00
Bushelings, unprepared new factory	28.00
Short steel turnings	28.00
Mixed borings, turnings	25.00
Cast scrap	58.00 to 60.00

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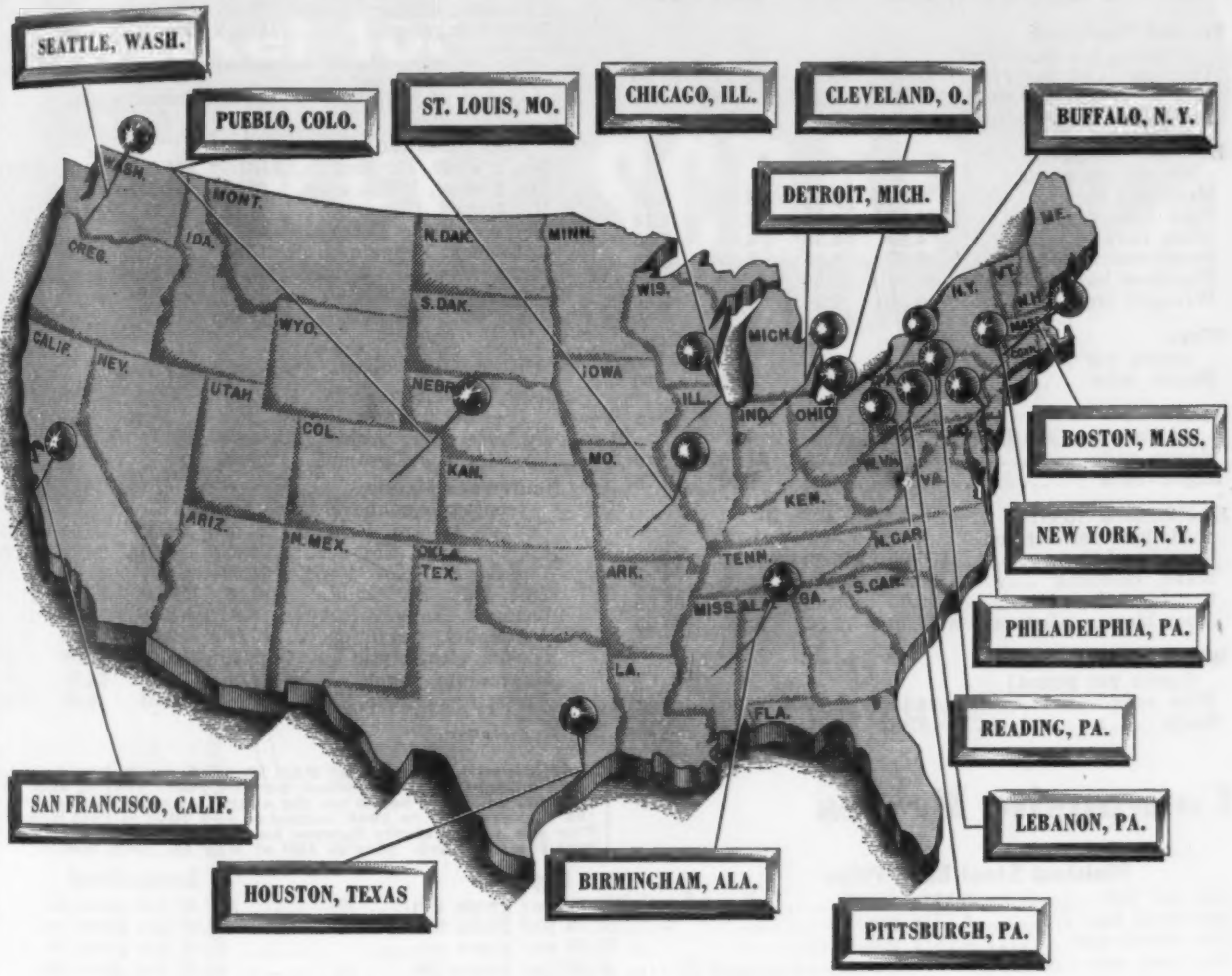

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel: (cents per pound)	Oct. 23, 1951	Oct. 16, 1951	Sept. 25, 1951	Oct. 24, 1950
Hot-rolled sheets	3.60	3.60	3.60	3.35
Cold-rolled sheets	4.35	4.35	4.35	4.10
Galvanized sheets (10 ga)	4.80	4.80	4.80	4.40
Hot-rolled strip	3.50	3.50	3.50	3.25
Cold-rolled strip	4.75	4.75	4.75	4.21
Plate	3.70	3.70	3.70	3.50
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip(No. 302)	36.75	36.75	36.75	34.50
Tin and Ternplate: (dollars per base box)				
Tinplate (1.50 lb.) cokes.	$8.70	$8.70	$8.70	$7.50
Tinplate, electro (0.50 lb.)	7.40	7.40	7.40	6.60
Special coated mfg. ternes	7.50	7.50	7.50	6.35
Bars and Shapes: (cents per pound)				
Merchant bars	3.70	3.70	3.70	3.45
Cold finished bars	4.55	4.55	4.55	4.15
Alloy bars	4.30	4.30	4.30	3.95
Structural shapes	3.65	3.65	3.65	3.40
Stainless bars (No.302)	31.50	31.50	31.50	30.00
Wrought iron bars	9.50	9.50	9.50	9.50
Wire: (cents per pound)				
Bright wire	4.85	4.85	4.85	4.50
Rails: (dollars per 100 lb)				
Heavy rails	$3.60	$3.60	$3.60	$3.40
Light rails	4.00	4.00	4.00	3.75
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$56.00	$56.00	$56.00	$54.00
Slabs, rerolling	56.00	56.00	56.00	54.00
Forging billets	66.00	66.00	66.00	63.00
Alloy blooms billets, slabs	70.00	70.00	70.00	66.00
Wire Rod and Skelp: (cents per pound)				
Wire rods	4.10	4.10	4.10	3.85
Skelp	3.35	3.35	3.35	3.15

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Pig Iron: (per gross ton)	Oct. 23, 1951	Oct. 16, 1951	Sept. 25, 1951	Oct. 24, 1950
No. 2 foundry, del'd Phila.	$57.77	$57.77	$57.77	$52.77
No. 2, Valley furnace	52.50	52.50	52.50	49.50
No. 2, Southern Cin'ti	55.58	55.58	55.58	52.58
No. 2, Birmingham	48.88	48.88	48.88	45.88
No. 2, foundry, Chicago†	52.50	52.50	52.50	49.50
Basic del'd Philadelphia	56.92	56.92	56.92	51.92
Basic, Valley furnace	52.00	52.00	52.00	49.00
Malleable, Chicago†	52.50	52.50	52.50	49.50
Malleable, Valley	52.50	52.50	52.50	49.50
Charcoal, Chicago	70.56	70.56	70.56	70.56
Ferromanganese‡	186.25	186.25	186.25	173.40

†The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡Average of U. S. prices quoted on Ferroalloy page.

Scrap: (per gross ton)	Oct. 23, 1951	Oct. 16, 1951	Sept. 25, 1951	Oct. 24, 1950
No. 1 steel, Pittsburgh	*$43.00**	$44.00*	$44.00*	$43.75
No. 1 steel, Phila. area	*41.50*	42.50*	42.50*	38.50
No. 1 steel, Chicago	*41.50*	42.50*	42.50*	39.75
No. 1 bundles, Detroit	41.15*	41.15*	41.15*	37.25
Low phos. Young'n	46.50*	46.50*	46.50*	46.25
No. 1 cast, Pittsburgh	49.00†	49.00†	49.00†	55.75
No. 1 cast, Philadelphia	49.00†	49.00†	49.00†	51.50
No. 1 cast, Chicago	49.00†	49.00†	49.00†	55.50

*Basing Pt. †Shipping Pt.
Not including broker's fee after Feb. 7, 1951.

Coke: Connellsville: (per net ton at oven)	Oct. 23, 1951	Oct. 16, 1951	Sept. 25, 1951	Oct. 24, 1950
Furnace coke, prompt	$14.75	$14.75	$14.75	$14.25
Foundry coke, prompt	17.75	17.75	17.75	16.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro, Conn.	24.50	24.50	24.50	24.50
Copper, Lake, Conn.	24.625	24.625	24.625	24.625
Tin, Straits, New York	$1.03†	$1.03	$1.03	$1.175
Zinc, East St. Louis	19.50	19.50	17.50	17.50
Lead, St. Louis	18.80	18.80	16.80	15.80
Aluminum, virgin	19.00	19.00	19.00	19.00
Nickel, electrolytic	59.58	59.58	59.58	51.22
Magnesium, ingot	24.50	24.50	24.50	24.50
Antimony, Laredo, Tex.	42.00	42.00	42.00	32.00

†Tentative.

Composite Prices

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 130 of May 12, 1949, issue.)

	Finished Steel Base Price	Pig Iron	Scrap Steel
Oct. 23, 1951	4.131¢ per lb.	$52.69 per gross ton	*$42.00* per gross ton
One week ago	4.131¢ per lb.	52.69 per gross ton	43.00 per gross ton
One month ago	4.131¢ per lb.	52.69 per gross ton	43.00 per gross ton
One year ago	3.837¢ per lb.	49.36 per gross ton	40.67 per gross ton

	Finished Steel Base Price High		Finished Steel Base Price Low		Pig Iron High		Pig Iron Low		Scrap Steel High		Scrap Steel Low	
1951	4.131¢	Jan. 2	4.131¢	Jan. 2	$52.69	Jan. 2	$52.69	Jan. 2	$47.75	Jan. 30	$42.00	Oct. 23
1950	4.131¢	Dec. 1	3.837¢	Jan. 3	52.69	Dec. 12	45.88	Jan. 3	45.13	Dec. 19	26.25	Jan. 3
1949	3.837¢	Dec. 27	3.3705¢	May 3	46.87	Jan. 18	45.88	Sept. 6	43.00	Jan. 4	19.33	June 28
1948	3.721¢	July 27	3.193¢	Jan. 1	46.91	Oct. 12	39.58	Jan. 6	43.16	July 27	39.75	Mar. 9
1947	3.193¢	July 29	2.848¢	Jan. 1	37.98	Dec. 30	30.14	Jan. 7	42.58	Oct. 28	29.50	May 20
1946	2.848¢	Dec. 31	2.464¢	Jan. 1	30.14	Dec. 10	25.37	Jan. 1	31.17	Dec. 24	19.17	Jan. 1
1945	2.464¢	May 29	2.396¢	Jan. 1	25.37	Oct. 23	23.61	Jan. 2	19.17	Jan. 2	18.92	May 22
1944	2.396¢		2.396¢		$23.61		$23.61		19.17	Jan. 11	15.76	Oct. 24
1943	2.396¢		2.396¢		23.61		23.61		$19.17		$19.17	
1942	2.396¢		2.396¢		23.61		23.61		19.17		19.17	
1941	2.396¢		2.396¢		$23.61	Mar. 20	$23.45	Jan. 2	$22.00	Jan. 7	$19.17	Apr. 10
1940	2.30467¢	Jan. 2	2.24107¢	Apr. 16	23.45	Dec. 23	22.61	Jan. 2	21.83	Dec. 30	16.04	Apr. 9
1939	2.35367¢	Jan. 3	2.26689¢	May 16	22.61	Sept. 19	20.61	Sept. 12	22.50	Oct. 3	14.08	May 16
1938	2.58414¢	Jan. 4	2.27207¢	Oct. 18	23.25	June 21	19.61	July 6	15.00	Nov. 22	11.00	June 7
1937	2.58414¢	Mar. 9	2.32263¢	Jan. 4	32.25	Mar. 9	20.25	Feb. 16	21.92	Mar. 30	12.67	June 9
1936	2.32263¢	Dec. 28	2.05200¢	Mar. 10	19.74	Nov. 24	18.73	Aug. 11	17.75	Dec. 21	12.67	June 8
1932	1.89196¢	July 5	1.83910¢	Mar. 1	14.81	Jan. 5	13.56	Dec. 6	8.50	Jan. 12	6.43	July 6
1929	2.31773¢	May 28	2.26498¢	Oct. 29	18.71	May 14	18.21	Dec. 17	17.58	Jan. 29	14.08	Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 18, 1941, issue and in May 12, 1949.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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IRON AGE

STEEL PRICES

Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page.
Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.

	Pittsburgh	Chicago	Gary	Cleveland	Canton Massillon	Middletown	Youngstown	Bethlehem	Buffalo	Conshohocken	Johnstown	Sparrows Point	Granite City	Detroit
INGOTS Carbon forging, net ton	$52.00[1]													
Alloy, net ton	$54.00[1,17]													$54.00[1]
BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton	$56.00[1,6]	$56.00[1]	$56.00[1]						$56.00[3]		$56.00[3]			
Carbon forging billets, net ton	$66.00[1,5]	$66.00[1,4]	$66.00[1]	$66.00[4]	$66.00[4]				$66.00[3,4]	$73.00[3,6]	$66.00[3]			$69.00[1]
Alloy, net ton	$70.00[1,17,6]	$70.00[1,4]	$70.00[1,6]		$70.00[4]			$70.00[3]	$70.00[3,4]	$77.00[3,6]	$70.00[3]			$73.00[1]
PIPE SKELP	3.35[1] 3.45[5]						3.35[1,4]							
WIRE RODS	4.10[2] 4.30[16]	4.10[2,4,33]	4.10[6]	4.10[2]			4.10[6]		4.10[35]		4.10[2]	4.20[5]		
SHEETS Hot-rolled (18 ga. & hvr.)	3.60[1,5,9,15] 3.75[28]	3.60[5,23]	3.60[1,5,9]	3.60[4,5]		3.60[7]	3.60[1,4,5] 4.00[13]		3.60[3]	4.00[26]		3.60[5]	4.30[22]	3.60[13] 4.00[47]
Cold-rolled	4.35[1,5,9,15,7]		4.35[1,5,8]	4.35[4,5]		4.35[7]	4.35[4,5]		4.35[3]			4.35[5]	5.05[23]	4.80[13]
Galvanized (10 gage)	4.80[1,9,15]		4.80[1,8]		4.80[4]	4.80[7]	5.50[44] 6.00[64]					4.80[5]	5.90[23]	
Enameling (12 gage)	4.65[1]		4.65[1,8]	4.65[4]		4.65[7]	4.65[5]						5.35[22]	
Leng terne (10 gage)	5.20[9,15]		5.20[1]			5.20[7]	6.00[64]							
Hi str. low alloy, h.r.	5.40[1,5] 5.75[9]	5.40[1]	5.40[1,8] 5.90[6]	5.40[4,5]			5.40[1,4,13] 5.90[6]		5.40[3]	5.65[26]		5.40[5]		5.90[13]
Hi str. low alloy, c.r.	6.55[1,5] 6.90[9]		6.55[1,8] 7.05[6]	6.55[4,5]			6.55[4] 7.05[6]		6.55[3]			6.55[5]		7.10[13]
Hi str. low alloy, galv.	7.20[1]											6.75[5]		
STRIP Hot-rolled	3.60[9],4.00[41,58], 3.75[28] 3.50[5,7]	3.50[66]	3.50[1,6,8]			3.50[7]	3.50[1,4,6] 4.00[13]		3.50[3,4]	3.90[26]	3.50[3]	3.50[5]		4.40[47] 3.80[13]
Cold-rolled	4.65[5,7,9] 5.00[28] 5.35[40,63,68]	4.90[5,66]	4.90[6]	4.65[2,5]		4.65[7]	4.65[4,6] 5.25[48,49] 5.35[13,40]		4.65[3]			4.65[5]		4.85[13] 5.45[47] 5.00[64,41]
Hi str. low alloy, h.r.	5.79[9]		5.50[1] 5.30[5],5.80[6]				4.95[4], 5.50[1] 5.40[13],5.80[6]		4.95[3]	5.55[26]		4.95[5]		5.05[13]
Hi str. low alloy, c.r.	7.20[9]			{6.55[2] 6.70[5]			{6.20[4], 6.55[13] 7.05[6]		6.40[3]			6.40[5]		
TINPLATE† Cokes, 1.25-lb base box (1.50 lb, add 25¢)	$8.45[1,5,9,15]		$8.45[1,6,8]				$8.45[4]					$8.55[3]		
Electrolytic 0.25, 0.50, 0.75 lb box	0.25 lb base box, $7.15[1,4,5,8,9]; $7.25[3,11]; $7.35[22] 0.50 lb, add 25¢; 0.75 lb add 65¢													
BLACKPLATE, 29 gage Hollowware enameling	5.85[1] 6.15[14]		5.85[1]				5.30[4]							
BARS Carbon steel	3.70[1,5] 3.85[9]	3.70[1,4,33]	3.70[1,4,6,8]	3.70[4]	3.70[4]		3.70[1,4,6]		3.70[3,4]		3.70[3]			3.85[1] 4.00[36]
Reinforcing	3.70[1,5]	3.70[4]	3.70[1,6,8]	3.70[4]			3.70[1,4,6]		3.70[3,6]		3.70[3]	3.70[5]		
Cold-finished	4.55[3,4,5,52,69,71]	4.55[3,33,70]	4.55[4,74,75]	4.55[3]	4.55[4,52]		4.55[6,57]		4.60[70]					4.70[4]
Alloy, hot-rolled	4.30[1,17]	4.30[1,4,33]	4.30[1,6,8]		4.30[4]		4.30[1,6]	4.30[3]	4.30[3,4]		4.30[3]			4.45[1] 4.85[13]
Alloy, cold-drawn	5.40[17,52,69,71,3] 5.45[3]	5.40[4,33,69,70,73]	5.40[4,73,74]		5.40[4,52]		5.40[6,33,57]	5.40[3]	5.40[3]					5.55[4] 5.60[64]
Hi str. low alloy, h.r.	5.55[1,5]		5.55[1,8] 6.05[6]	5.55[4,5]			5.55[1] 6.05[6]	5.55[3]	5.55[3]		5.55[3]			
PLATE Carbon steel	3.70[1,5,15] 4.00[9]	3.70[1,33]	3.70[1,6,8]	3.70[4,5]			3.70[1,4,6] 3.95[13]		3.70[3]	4.15[26]	3.70[3]	3.70[5]	4.40[22]	
Floor plates	4.75[1]	4.75[1]	4.75[6]	4.75[5]						4.75[26]				
Alloy	4.75[1]	4.75[1]	4.75[1]				5.20[13]			5.05[26]	4.75[3]	4.75[3]		
Hi str. low alloy	5.65[1,5]	5.65[1]	5.65[1,8] 6.15[6]	5.65[4,5]			{5.65[4] 5.70[13] 6.15[6]			5.90[26]	5.65[3]	5.65[3]		
SHAPES, Structural	3.65[1,5] 3.90[9]	3.65[1,33]	3.65[1,8]					3.70[3]	3.70[3]		3.70[3]			
Hi str. low alloy	5.50[1,5]	5.50[1]	5.50[1,8] 6.00[6]				6.00[6]	5.50[3]	5.50[3]		5.50[3]			
MANUFACTURERS' WIRE Bright	4.85[2,5] 5.10[18]	4.65[2] 4.35,34		4.85[2]			4.85[6]	Kokomo—4.85[10] 4.85[35]			4.85[3]	4.95[3]	Duluth—4.85[3]	
PILING, Steel Sheet	4.45[1]	4.45[1]	4.45[6]						4.45[3]					

STEEL PRICES

Smaller numbers indicate producing companies. See key at right. Prices are in cents per lb unless otherwise noted. Extras apply.

Kansas City	Houston	Birmingham	WEST COAST Seattle, San Francisco, Los Angeles, Fontana		
			F=$78.00[19]		INGOTS Carbon forging, net ton
	$82.00[83]		F=$80.00[19]		Alloy, net ton
		$56.00[11]	F=$75.00[19]		BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton
	$74.00[83]	$66.00[11]	F=$85.00[19] SF, LS, S=$85.00[83]	Geneva=$66.00[16]	Carbon forging billets, net ton
	$78.00[83]		F=$89.00[19] LA=$90.00[83]		Alloy net ton
				Alton=4.40[83] Worcester=4.40[3] Minnequa=4.35[14] Portsmouth=4.30[30]	PIPE SKELP
	4.50[83]	4.10[4-11]	SF=4.90[3], F=4.90[19] LA=4.90[24-83]		WIRE RODS
		3.60[4-11]	SF, LA=4.30[24] F=4.55[19]	Niles=5.25[24], Geneva=3.70[16] Ashland=3.60[7]	SHEETS Hot-rolled (18 ga. & hvr.)
		4.35[11]	SF=5.30[24] F=5.30[19]		Cold-rolled
		4.80[4-11]	SF, LA=5.55[24]	Ashland=4.80[7] Kokomo=5.20[30]	Galvanized (10 gage)
				Ashland=4.65[7]	Enameling (12 gage)
					Long ternes (10 gage)
		5.40[11]	F=6.35[19]		HI str. low alloy, h.r.
			F=7.50[19]		HI str. low alloy, c.r.
					HI str. low alloy, galv.
4.10[83]	4.90[83]	3.60[4-11]	SF, LA=4.25[24-83] F=4.75[19], S=4.50[83]	Alton=3.95[32] Atlanta=4.05[58] Minnequa=4.55[14] Ashland=3.50[7]	STRIP Hot-rolled
			F=6.30[19] LA=6.40[27]	New Haven=5.15[3], 5.85[58] Trenton=6.00[45]	Cold-rolled
		5.30[11]	F=6.20[19] SF, LA=6.05[83] S=6.30[83]		HI str. low alloy, h.r.
			F=8.95[19]		HI str. low alloy, c.r.
		$8.55[11]	SF=9.20[24]		TINPLATE Cokes, 1.25-lb base box (1.50 lb. add 25¢)
					Electrolytic 0.25, 0.50, 0.75 lb box
					BLACKPLATE, 29 gage Hollowware enameling
4.30[83]	4.10[83]	3.70[4-11]	SF, LA=4.40[24]	Alton=4.15[32] Atlanta=4.25[58] Minnequa=4.15[14]	BARS Carbon steel
4.30[83]	4.10[83]	3.70[4-11]	SF, S=4.45[83] F=4.40[19], LA=4.40[83]	Atlanta=4.25[58] Minnequa=4.50[14]	Reinforcing
			LA=6.00[4]	Newark=5.00[69] Putnam=5.10[69] Hartford=5.10[4]	Cold-finished
4.30[83]	4.70[83]		LA=5.35[83] F=5.35[19]		Alloy, hot-rolled
				Newark=5.75[69] Worcester=5.75[3] Hartford=5.65[4]	Alloy, cold-drawn
		5.55[11]	F=6.60[19], SF, S=6.30[83] LA=6.25[83]	Clayment=4.15[39] Coatesville=4.15[21] Harrisburg=6.75[35] Minnequa=4.50[14] Geneva=3.70[16]	HI str. low alloy, h.r.
	4.10[83]	3.70[4-11]	F=4.30[19] S=4.60[83]		PLATE Carbon steel
				Harrisburg=6.75[35]	Floor plates
			F=5.70[19]	Coatesville=5.25[21] Clayment=4.85[39]	Alloy
		5.65[11]	F=6.25[19] S=6.55[83]	Geneva=5.65[16]	HI str. low alloy
4.25[83]	4.05[83]	3.60[4] 3.65[11]	SF=4.20[83] F=4.25[19] LA=4.25[24-83] S=4.30[83]	Geneva 3.65[16] Minnequa 4.10[14] Phoenixville=6.25[50]	SHAPES, Structural
		5.50[11]	S=6.10[83] F=6.10[19] SF=6.00[83] LA=6.05[83]	Geneva=5.50[16]	HI str. low alloy
5.40[83]	5.25[83]	4.85[4-11]	SF, LA=5.80[24]	Alton=5.05[32] Atlanta=5.10[58] Worcester=5.15[3] Minnequa=5.10[14] Portsmouth=5.25[30]	MANUFACTURERS' WIRE Bright

† Special coated mfg ternes deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 to 128-lb. deduct $2.20 from 1.25-lb coke base box.

Key to Steel Producers

1 U. S. Steel Co., Pittsburgh
2 American Steel & Wire Co., Cleveland
3 Bethlehem Steel Co., Bethlehem
4 Republic Steel Corp., Cleveland
5 Jones & Laughlin Steel Corp., Pittsburgh
6 Youngstown Sheet & Tube Co., Youngstown
7 Armco Steel Corp., Middletown, Ohio
8 Inland Steel Co., Chicago
9 Weirton Steel Co., Weirton, W. Va.
10 National Tube Co., Pittsburgh
11 Tennessee Coal, Iron & R. R. Co., Birmingham
12 Great Lakes Steel Corp., Detroit
13 Sharon Steel Corp., Sharon, Pa.
14 Colorado Fuel & Iron Corp., Denver
15 Wheeling Steel Corp., Wheeling, W. Va.
16 Geneva Steel Co., Salt Lake City
17 Crucible Steel Co. of America, New York
18 Pittsburgh Steel Co., Pittsburgh
19 Kaiser Steel Corp., Oakland, Calif.
20 Portsmouth Div., Detroit Steel Corp., Detroit
21 Lukens Steel Co., Coatesville, Pa.
22 Granite City Steel Co., Granite City, Ill.
23 Wisconsin Steel Co., South Chicago, Ill.
24 Columbia Steel Co., San Francisco
25 Copperweld Steel Co., Glassport, Pa.
26 Alan Wood Steel Co., Conshohocken, Pa.
27 Calstrip Steel Corp., Los Angeles
28 Allegheny Ludlum Steel Corp., Pittsburgh
29 Claymont Steel Corp., Claymont, Del.
30 Continental Steel Corp., Kokomo, Ind.
31 Rotary Electric Steel Co., Detroit
32 Laclede Steel Co., Alton, Ill.
33 Northwestern Steel & Wire Co., Sterling, Ill.
34 Keystone Steel & Wire Co., Peoria, Ill.
35 Central Iron & Steel Co., Harrisburg, Pa.
36 Carpenter Steel Co., Reading, Pa.
37 Eastern Stainless Steel Corp., Baltimore
38 Washington Steel Corp., Washington, Pa.
39 Jessop Steel Co., Washington, Pa.
40 Blair Strip Steel Co., New Castle, Pa.
41 Superior Steel Corp., Carnegie, Pa.
42 Timken Steel & Tube Div., Canton, Ohio
43 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
44 Reeves Steel & Mfg. Co., Dover, Ohio
45 John A. Roebling's Sons Co., Trenton, N. J.
46 Simonds Saw & Steel Co., Fitchburg, Mass.
47 McLouth Steel Corp., Detroit
48 Cold Metal Products Co., Youngstown
49 Thomas Steel Co., Warren, Ohio
50 Wilson Steel & Wire Co., Chicago
51 Sweet's Steel Co., Williamsport, Pa.
52 Superior Drawn Steel Co., Monaca, Pa.
53 Tremont Nail Co., Wareham, Mass.
54 Firth Sterling St. & Carbide, McKeesport
55 Ingersoll Steel Div., Chicago
56 Phoenix Iron & Steel Co., Phoenixville, Pa.
57 Fitzsimons Steel Co., Youngstown
58 Stanley Works, New Britain, Conn.
59 Universal-Cyclops Steel Corp., Bridgeville, Pa.
60 American Cladmetals Co., Carnegie, Pa.
61 Cuyahoga Steel & Wire Co., Cleveland
62 Bethlehem Pacific Coast Steel, San Fran.
63 Follansbee Steel Corp., Pittsburgh
64 Niles Rolling Mill Co., Niles, Ohio
65 Atlantic Steel Co., Atlanta
66 Acme Steel Co., Chicago
67 Joslyn Mfg. & Supply Co., Chicago
68 Detroit Steel Corp., Detroit
69 Wycoff Steel Co., Pittsburgh
70 Bliss & Laughlin, Inc., Harvey, Ill.
71 Columbia Steel & Shafting Co., Pittsburgh
72 Cumberland Steel Co., Cumberland, Md.
73 La Salle Steel Co., Chicago
74 Monarch Steel Co., Inc., Hammond, Ind.
75 Empire Steel Co., Mansfield, Ohio
76 Mahoning Valley Steel Co., Niles, Ohio
77 Oliver Iron & Steel Co., Pittsburgh
78 Pittsburgh Screw & Bolt Co., Pittsburgh
79 Standard Forging Corp., Chicago
80 Driver Harris Co., Harrison, N. J.
81 Detroit Tube & Steel Div., Detroit
82 Reliance Div., Eaton Mfg. Co., Massillon, Ohio
83 Sheffield Steel Corp., Kansas City
84 Plymouth Steel Co., Detroit
85 Wickwire Spencer Steel, Buffalo
86 Angell Nail and Chaplet, Cleveland
87 Mid-States Steel & Wire, Crawfordsville, Ind.
88 National Supply, Pittsburgh, Pa.
89 Wheatland Tube Co., Wheatland, Pa.
90 Mercer Tube & Mfg. Co., Sharon, Pa.
91 Woodward Iron Co., Woodward, Ala.
92 Sloss-Sheffield Steel & Iron Co., Birmingham
93 Hanna Furnace Corp., Detroit
94 Interlake Iron Corp., Cleveland
95 Lone Star Steel Co., Dallas
96 Mystic Iron Works, Everett, Mass.
97 Jackson Iron & Steel Co., Jackson, O.
98 Globe Iron Co., Jackson, O.
99 Pittsburgh Coke & Chemical Co., Pittsburgh
100 Shenango Furnace Co., Pittsburgh
101 Tennessee Products & Chem. Corp., Nashville
102 Koppers Co., Inc., Granite City, Ill.
103 Page Steel & Wire Div., American Chain & Cable, Monessen, Pa.
104 Wallingford Steel Co., Wallingford, Conn.
105 Tonawanda Iron Div., N. Tonawanda, N. Y.
106 Pilgrim Drawn Steel Div., Automotive Materials Corp., Plymouth, Mich.

STAINLESS STEELS

Base price, cents per lb, f.o.b. mill

Product	301	302	303	304	316	321	347	410	416	430
Ingots rerolling	14.25	15.25	16.75	16.25	24.75	20.00	21.75	12.75	14.75	13.00
Slabs billets rerolling	18.50	20.00	22.00	21.00	32.25	26.25	28.50	16.50	20.00	16.75
Forg. discs die blocks rings	34.00	34.25	36.75	35.75	53.00	40.25	44.75	28.00	28.50	28.50
Billets forging	26.25	26.50	28.50	27.75	41.50	31.25	35.00	21.50	22.00	22.00
Bars wires structurals	31.25	31.50	34.00	33.00	49.25	37.00	41.50	25.75	26.25	26.25
Plates	33.00	33.25	35.25	35.25	52.00	40.75	45.25	27.00	27.50	27.50
Sheets	41.00	41.25	43.25	43.25	57.00	49.25	53.75	36.50	37.00	39.00
Strip hot-rolled	26.50	26.25	32.50	30.25	48.75	37.00	41.25	23.50	30.25	24.00
Strip cold-rolled	34.00	36.75	40.25	38.75	59.00	48.25	52.25	30.50	37.00	31.00

STAINLESS STEEL PRODUCING POINTS — *Sheets:* Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38 (type 316 add 4, 5¢), 39; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Ft. Wayne, Ind., 67; Lockport, N. Y., 45.

Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38 (type 316 add 4, 5¢); W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 80; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, Pa., 13 (type 301 add ¼¢); Butler, Pa., 7; Wallingford, Conn., 104.

Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42; Ft. Wayne, Ind., 67.

Wire: Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Ft. Wayne, Ind., 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28; Monessen, 103; Syracuse, N. Y., 17; Bridgeville, Pa., 59.

Structurals: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44; Syracuse, N. Y., 17.

Plates: Brackenridge, Pa., 28 (type 416 add ½¢); Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

Forged discs, die blocks, rings: Pittsburgh, 17; Syracuse, 17; Ferndale, Mich., 28; Washington, Pa., 39.

Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1; Syracuse, N. Y., 17.

*ALLEGHENY LUDLUM — Slightly higher on Type 301; slightly lower on others in 300 Series.

WASHINGTON STEEL — Slightly lower on 300 Series except where noted.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Base Col.	Woven Wire Fence 9-15½ ga. Base Col.	Fence Posts Base Col.	Single Loop Bale Ties Base Col.	Twisted Barbless Wire Base Col.	Gal. Barbed Wire Base Col.	Merch. Wire Am'ld ¢/lb.	Merch. Wire Gal. (1) ¢/lb.
Alabama City-4	118	126	....	123	....	136	5.70	5.95
Aliquippa, Pa.-5	118	132	....	....	136	140	5.70	6.15
Atlanta-65	121	133	....	126	126	143	5.95	6.40
Bartonville-34	118	130	....	123	143	143	5.70	6.15
Buffalo-85	....	....	....	....	....	....	4.85	....
Cleveland-86	125	....	....	....	....	....	....	....
Cleveland-2	....	....	....	....	....	....	5.70	6.15
Crawfordsville-87	....	132	....	....	....	145	5.95	6.40
Donora, Pa.-2	118	130	....	123	140	140	5.70	6.15
Duluth-2	118	130	....	123	140	140	5.70	6.15
Fairfield, Ala.-11	118	130	....	123	....	140	5.70	6.15
Houston-83	126	138	....	....	....	148	6.10	6.55
Johnstown, Pa.-3	118	130	....	....	140	....	5.70	6.15
Joliet, Ill.-2	118	130	....	123	....	140	5.70	6.15
Kokomo, Ind.-30	120	132	....	125	138	142	5.80	6.05
Los Angeles-62	....	....	....	....	....	....	6.65	....
Kansas City-83	130	....	....	135	....	152	6.30	6.75
Minnequa-14	123	138	130	128	146	146	5.95	6.45
Monessen-18	124	135	....	....	....	145	5.95	6.40
Moline, Ill.-4	....	....	138	....	....	....	....	....
Pittsburg, Cal.-24	137	....	....	147	156	160	6.65	6.80
Portsmouth-20	124	137	....	....	....	147	6.10	6.60
Rankin, Pa.-2	118	130	....	....	140	140	5.70	6.15
So. Chicago, Ill.-4	118	126	140	123	....	136	5.70	5.95
S. San Fran.-14	....	....	....	147	....	160	6.65	7.10
Sparrows Pt.-3	120	....	....	125	142	142	5.80	6.25
Sterling, Ill.-33	118	130	....	123	140	140	5.70	6.15
Struthers, Ohio-6	....	....	....	....	....	....	5.70	6.15
Torrance, Cal.-24	138	....	....	....	....	....	6.65	....
Worcester-2	124	....	....	....	....	....	6.00	6.45
Williamsport, Pa.-51	....	....	150	....	....	....	....	....

Cut Nails, carloads, base, $7.35 per 100 lb (less 20¢ to jobbers), at Conshohocken, Pa., (26), Wheeling, W. Va., (15), $7.15.

(1) Alabama City and So. Chicago do not include zinc extra.

CAST IRON WATER PIPE

Per Net Ton

6 to 24-in., del'd Chicago $105.30 to $108.80
6 to 24-in., del'd N.Y. ... 108.50 to 109.50
6 to 24-in., Birmingham 91.50 to 96.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less ..... $123.00 to $130.00

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Axles	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer-1	3.60	4.00	4.70					
Chicago-4	....	....	....	6.15	....	....	....	....
Cleveland-3	....	....	....	....	....	9.35	....	....
Ensley-11	3.60	4.00	....	....	....	....	....	....
Fairfield-11	....	4.00	4.70	6.15	5.60	....	4.50	5.85
Gary-1	3.60	4.00	....	....	....	....	....	....
Ind. Harbor-8	3.60	....	4.70	6.15	5.60	....	4.50	5.85
Johnstown-3	....	4.00	....	....	5.60	....	4.50	....
Joliet-1	....	4.00	4.70	....	....	....	....	....
Kansas City-83	....	....	....	6.40	....	....	....	5.85
Lackawanna-3	3.60	4.00	4.70	....	....	....	4.50	....
Lebanon-3	....	....	....	6.15	....	9.35	....	5.85
Minnequa-14	3.60	4.50	4.70	6.15	....	....	4.50	5.85
Pittsburgh-3	....	....	....	....	....	9.35	....	....
Pittsburgh-77	....	....	....	....	....	9.35	....	5.85
Pittsburgh-78	....	....	....	....	....	....	....	5.85
Pittsburgh-5	....	....	....	6.15	....	....	....	....
Pittsburgh-24	....	....	....	....	....	....	4.65	....
Seattle-62	....	....	....	6.65	....	....	4.65	....
Steelton-3	3.60	....	4.70	....	....	....	4.50	....
Struthers-6	....	....	....	6.15	....	....	....	....
Torrance-24	....	....	....	....	....	....	4.65	....
Youngstown-4	....	....	....	6.15	....	....	....	....
Cleveland-4	....	....	....	....	....	9.35	....	....

BOILER TUBES

$ Per 100 ft., cut, 10 to 24 ft

F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	22.67	25.65	21.99	25.65
	2½	12	30.48	35.84	29.57	34.78
	3	12	33.90	39.90	32.89	38.70
	3½	11	42.37	49.89	41.10	48.38
	4	10	52.60	61.88	51.03	60.02
National Tube	2	13	21.62	26.48	....	....
	2½	12	29.65	36.32	....	....
	3	12	34.00	41.64	....	....
	3½	11	40.34	49.41	....	....
	4	10	51.21	62.72	....	....
Pittsburgh Steel	2	13	....	27.00	....	....
	2½	12	30.49	37.15	....	....
	3	12	34.95	42.59	....	....
	3½	11	41.48	50.54	....	....
	4	10	52.65	64.16	....	....

FLUORSPAR

Washed gravel, f.o.b. Rosiclaire, Ill. Price, net ton; Effective CaF_2 content:
70% or more $43.00
60% or less 40.00

PIPE AND TUBING

Base discounts, f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD ½ In. Blk.	½ In. Gal.	¾ In. Blk.	¾ In. Gal.	1 In. Blk.	1 In. Gal.	1¼ In. Blk.	1¼ In. Gal.	1½ In. Blk.	1½ In. Gal.	2 In. Blk.	2 In. Gal.	2½-3 In. Blk.	2½-3 In. Gal.	SEAMLESS 2 In. Blk.	2 In. Gal.	2½-3 In. Blk.	2½-3 In. Gal.	3½-4 In. Blk.	3½-4 In. Gal.
STANDARD T. & C.																				
Sparrows Pt.-3	34.0	12.0	37.0	16.0	39.5	19.5	40.0	20.0	40.5	21.0	41.0	21.5	41.5	22.0	....	....	....	....	....	....
Cleveland-4	36.0	14.0	39.0	18.0	41.5	21.5	42.9	22.0	42.5	23.0	43.0	23.5	43.5	24.0	....	....	....	....	....	....
Oakland-19	25.0	3.0	28.0	7.0	30.5	10.5	31.0	11.0	31.5	12.0	32.0	12.5	32.5	13.0	....	....	....	....	....	....
Pittsburgh-5	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	29.5	8.0	32.5	11.5	34.5	13.5
Pittsburgh-10	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	9.5	32.5	12.5	34.5	14.5
Alton, Ill.-32	35.0	13.0	38.0	17.0	40.5	20.5	41.0	21.0	41.5	22.0	42.0	22.5	42.5	23.0	....	....	....	....	....	....
Sharon-90	36.0	13.0	39.0	17.0	41.5	20.0	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.0	....	....	....	....	....	....
Pittsburgh-88	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	....	32.5	....	34.5	....
Wheeling-15	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	....	....	....	....	....	....
Wheatland-89	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	....	....	....	....	....	....
Youngstown-6	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	9.5	32.5	12.5	34.5	14.5
EXTRA STRONG, PLAIN ENDS																				
Sparrows Pt.-3	33.5	13.0	37.5	17.0	39.5	20.5	40.0	21.0	40.5	22.0	41.0	22.5	41.5	23.0	....	....	....	....	....	....
Cleveland-4	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	....	....	....	....	....	....
Oakland-19	24.5	4.0	28.5	8.0	30.5	11.5	31.0	12.0	31.5	13.0	32.0	13.5	32.5	14.0	....	....	....	....	....	....
Pittsburgh-5	35.5	13.5	39.5	17.5	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	29.0	7.5	33.0	12.0	36.5	15.5
Pittsburgh-10	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0	10.0	33.0	14.0	36.5	17.5
Alton, Ill.-32	32.5	12.0	36.5	16.0	38.5	19.5	39.0	20.0	39.5	21.0	40.0	21.5	40.5	22.0	....	....	....	....	....	....
Sharon-90	35.5	14.0	39.5	18.0	41.5	21.0	42.0	21.5	42.5	22.0	43.0	22.5	43.5	23.0	....	....	....	....	....	....
Pittsburgh-88	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0	....	33.0	....	36.5	....
Wheeling-15	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	....	....	....	....	....	....
Wheatland-89	35.5	13.5	39.5	17.5	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	....	....	....	....	....	....
Youngstown-6	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	26.0	29.0	10.0	33.0	14.0	36.5	17.5

Galvanized discounts based on zinc, at 17¢ per lb, East St. Louis. For each 1¢ change in zinc, discounts vary as follows: ½ in., ¾ in., and 1 in., 1 pt.; 1¼ in., 1½ in., 2 in., ¾ pt.; 2½ in., 3 in., ½ pt. Calculate discounts on even cents per lb of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb, use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢.

Threads only, buttweld and seamless, 1 pt. higher discount. Plain ends, buttweld and seamless, 3 in. and under, 3½ pts. higher discount. Buttweld jobbers' discount, 5 pct. East St. Louis zinc price now 19.50¢.

WAREHOUSES

Base price, f.o.b., dollars per 100 lb. *(Metropolitan area delivery add 20¢ except Birmingham, San Francisco, Cincinnati, New Orleans, St. Paul, add 15¢; Memphis, add 10¢; Philadelphia, add 25¢; New York, add 30¢).

Cities	Sheets			Strip		Plates	Shapes	Bars		Alloy Bars			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled A 4615 As rolled	Hot-Rolled A 4140 Annealed	Cold-Drawn A 4615 As rolled	Cold-Drawn A 4140 Annealed
Baltimore	6.60	6.84	7.48[2]–8.07	6.04	.....	5.80	6.14	6.04	6.84–6.89	10.24	10.54	11.89	12.19
Birmingham*	6.60	6.40	6.75	5.55	.....	5.95	5.70	5.55	.....	.....	.....	.....	.....
Boston	6.20	7.00–7.25	7.74–8.29	6.15	8.50[4]	6.48–6.78	6.20	6.05	6.79–8.84	10.25	10.55	11.90–12.00	12.20–12.30
Buffalo	5.60	6.40	7.74–8.09	5.86	.....	6.05	5.80	5.60	6.40–6.45	10.15–10.85	10.45	11.80	11.95–12.10
Chicago	5.60	6.40	7.75	5.55	.....	5.80	5.70	5.55	6.30	9.80	10.10	11.45	11.75
Cincinnati*	5.67	6.44	7.39	5.80	.....	6.19	6.09	5.80	6.61	10.15	10.45	11.80	12.10
Cleveland	5.60	6.40	8.10	5.69	6.90	5.82	5.82	5.57	6.40	9.91	10.21	11.56	11.86
Detroit	5.78	6.53	7.89	5.94	.....	5.99	6.09	5.84	6.56	10.11	10.41	11.76	12.06
Houston	7.00	8.25	.....	.....	.....	6.85	6.50	6.65	9.35	10.35	11.25	.....	12.75
Indianapolis, del'd	6.00	6.80	8.15	5.95	.....	6.20	6.10	5.95	6.80	.....	.....	.....	.....
Kansas City	6.00	6.80	7.45	6.15	7.50	6.40	6.30	6.15	7.00	10.40	10.70	12.05	12.35
Los Angeles	6.35	7.90	8.85	6.40	9.45[5]	6.40	6.35	6.35	8.20	11.30	11.30	13.20	13.50
Memphis*	6.33–6.38	7.08–7.18	.....	6.33–6.38	.....	6.43–8.02	6.33–6.48	6.08–6.33	7.16–7.32	.....	.....	.....	.....
Milwaukee	5.74	6.54	7.89	5.69–6.59	.....	5.94	5.84	5.69	6.44–6.54	9.94	10.24	11.59	11.89
New Orleans*	5.70	6.50	.....	5.75	7.25	5.95	5.75	5.75	7.30	.....	.....	.....	.....
New York*	5.67–5.97	7.19[1]–7.24[1]	8.14[2]	6.29–6.89	8.63[4]	6.28–6.58	6.10	6.12	6.99	10.05–10.15	10.35–10.45	11.70–11.80	12.10–12.20
Norfolk	6.50[3]	.....	.....	.....	.....	6.50[3]	6.60[3]	6.35[3]	.....	.....	.....	.....	.....
Philadelphia*	5.90	6.80	8.00	6.10	.....	6.05	5.90	6.05	6.86	9.90	10.20	.....	.....
Pittsburgh	5.60	6.40	7.75	5.65–5.95	.....	5.75	5.70	5.55	6.15	9.80	10.10	11.45	11.75
Portland	6.60–7.55	8.95	8.50–9.10	7.30	.....	6.80	6.95	6.90	.....	.....	12.15	.....	.....
Salt Lake City	7.95	.....	9.70–10.50[2]	8.70–8.75	.....	8.05	6.75–8.30	7.95–8.65	9.00	.....	.....	.....	.....
San Francisco*	6.65	8.05[2]	8.55–8.90[2]	6.60	9.95[5]	6.50	6.45	6.45	8.20	11.30	11.30	13.20	13.20–13.80
Seattle	7.05	8.60	9.20	9.05	.....	6.75	6.65	6.75	9.05	.....	.....	.....	.....
St. Louis	5.80–5.85	6.65	8.00	5.80	8.00[4]–8.28	6.13	6.03	5.80	6.55–6.65	10.05	10.35	11.70	12.00
St. Paul*	6.16	6.96	8.31	6.11	.....	6.36	6.26	6.11	6.96	10.36	10.66	12.01	12.31

BASE QUANTITIES (Standard unless otherwise keyed): Cold finished bars; 2000 lb or over. Alloy bars; 1000 to 1999 lb. All others; 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 400 to 1999 lb; (4) 6000 lb and over; (5) 1500 to 9999 lb; (6) 2000 to 5999 lb.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Foundry	Malleable	Bessemer	Low Phos.	Blast Furnace Silvery	Low Phos. Charcoal
Bethlehem-3	54.00	54.50	55.00	55.50	.....	.....	.....
Birmingham-4	48.38	48.88	.....	.....	.....	.....	.....
Birmingham-91	48.38	48.88	.....	.....	.....	.....	.....
Birmingham-92	48.38	48.88	.....	.....	.....	.....	.....
Buffalo-4	52.00	52.50	53.00	.....	.....	.....	.....
Buffalo-93	52.00	52.50	53.00	.....	.....	63.75	.....
Chicago-94	52.00	52.50	52.50	53.00	.....	.....	.....
Cleveland-2	52.00	52.50	52.50	53.00	57.00	.....	.....
Cleveland-4	52.00	52.50	52.50	.....	.....	.....	.....
Daingerfield, Tex.-95	48.00	48.50	48.50	.....	.....	.....	.....
Duluth-94	52.00	52.50	52.50	53.00	.....	.....	.....
Erie-94	52.00	52.50	52.50	53.00	.....	.....	.....
Everett, Mass.-96	.....	57.00	57.50	.....	.....	.....	.....
Fontana-19	58.00	58.50	.....	.....	.....	.....	.....
Geneva, Utah-16	52.00	52.50	52.50	53.00	.....	.....	.....
Granite City, Ill.-102	53.90	54.40	54.90	.....	.....	.....	.....
Hubbard, Ohio-6	52.00	52.50	52.50	.....	.....	.....	.....
Ironton, Utah-16	52.00	52.50	.....	.....	.....	.....	.....
Jackson, Ohio-97, 98	.....	.....	.....	.....	.....	62.50	.....
Lyle, Tenn.-101	.....	.....	.....	.....	.....	.....	66.00
Monessen-18	54.00	.....	.....	.....	.....	.....	.....
Neville Island-99	52.00	52.50	52.50	53.00	.....	.....	.....
Pittsburgh-1	52.00	.....	.....	53.00	.....	.....	.....
Sharpsville-100	52.00	52.50	52.50	53.00	.....	.....	.....
Steelton-3	54.00	54.50	55.00	55.50	60.00	.....	.....
Swedeland-26	56.00	56.50	57.00	57.50	.....	.....	.....
Toledo-94	52.00	52.50	52.50	53.00	.....	.....	.....
Troy, N. Y.-4	54.00	54.50	55.00	.....	60.00	.....	.....
Youngstown-8	52.00	52.50	52.50	53.00	.....	.....	.....
N. Tonawanda, N. Y.-105	.....	52.50	53.00	.....	.....	.....	.....

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct, except low phos. 1.75 to 2.00 pct), 85¢ per ton for each 0.50 pct manganese over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus, content 0.70 pct and over. Silvery iron: Add $1.50 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. $1 per ton for 0.75 pct or more phosphorus, manganese as above. Bessemer premium on prices are $1 over comparable silvery iron.

REFRACTORIES

Fire Clay Brick *(F.o.b. works) Carloads, Per 1000*

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5)	$94.60
No. 1 Ohio	88.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	88.00
No. 2 Ohio	79.20
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	13.75

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$94.60
Childs, Pa.	99.00
Hays, Pa.	100.10
Chicago District	104.50
Western Utah and Calif.	111.10
Super Duty, Hays, Pa., Athens, Tex., Chicago	111.10
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	16.50
Silica cement, net ton, bulk, Hays, Pa.	18.70
Silica cement, net ton, bulk, Ensley, Ala.	17.60
Silica cement, net ton, bulk, Chicago District	17.60
Silica cement, net ton, bulk, Utah and Calif.	24.70

Chrome Brick *Per Net Ton*

Standard chemically bonded, Balt., Chester	$82.00

Magnesite Brick

Standard, Baltimore	$104.00
Chemically bonded, Baltimore	93.00

Grain Magnesite *St. 9-in. grains*

Domestic, f.o.b. Baltimore, in bulk fines removed	$62.70
Domestic, f.o.b. Chewelah, Wash., in bulk	36.30
in sacks	41.80

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢	$13.75

COKE

	Net Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$14.50 to $15.00
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$17.50 to $18.00
Foundry, oven coke	
Buffalo, del'd	$26.69
Chicago, f.o.b.	23.00
Detroit, f.o.b.	24.00
New England, del'd	25.00
Seaboard, N. J., f.o.b.	22.75
Philadelphia, f.o.b.	22.70
Swedeland, Pa., f.o.b.	22.60
Painesville, Ohio, f.o.b.	24.00
Erie, Pa., f.o.b.	23.50
Cleveland, del'd	25.72
Cincinnati, del'd	25.06
St. Paul, f.o.b.	22.50
St. Louis	25.40
Birmingham, del'd	21.69
Neville Island	23.00

LAKE SUPERIOR ORES

(51.50% *Fe; natural content, delivered lower lake ports*) *Per gross ton*

Old range, bessemer	$8.70
Old range, nonbessemer	8.55
Mesabi, bessemer	8.45
Mesabi, nonbessemer	8.30
High phosphorus	8.30

After adjustments for analyses, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

C-R SPRING STEEL

F.o.b. Mill Cents Per Lb.	CARBON CONTENT				
	0.26–0.40	0.41–0.60	0.61–0.80	0.81–1.05	1.06–1.35
Bridgeport, Conn.-58	5.35	6.80	7.40	9.35	11.60
Carnegie, Pa.-41	.....	6.80	7.40	9.35	11.60
Cleveland-2	4.65	6.45	7.40	9.35	11.60
Detroit-68	5.60	6.65	7.25	.....	.....
New Castle, Pa.-40	5.35	6.80	7.40	9.35	.....
New Haven, Conn.-68	5.85	6.75	7.35	.....	.....
Sharon, Pa.-13	5.35	6.80	7.40	9.35	11.60
Weirton, W. Va.-9	5.35	6.80	7.40	9.35	11.60
Worcester, Mass.-2	4.95	6.75	7.70	9.65	11.60
Youngstown-48	.....	6.80	7.40	9.35	11.60

Miscellaneous Prices

BOLTS, NUTS, RIVETS, SCREWS

Consumer Prices

(Base discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts

	Pct Off List Less Case	C.
½ in. & smaller x 6 in. & shorter	15	28½
9/16 in. & ⅝ in. x 6 in. & shorter	18½	30½
¾ in. & larger x 6 in. & shorter	17½	29½
All diam. longer than 6 in.	14	27½
Lag, all diam. x 6 in. & shorter	23	35
Lag, all diam. longer than 6 in.	21	33
Plow bolts	34	....

Nuts, Hot Pressed, Cold Punched—Sq

Pct Off List

	Less Keg Reg.	K. Reg.	Less Keg Hvy.	K. Hvy.
½ in. & smaller	15	28½	15	28½
9/16 in. & ⅝ in.	12	25	6½	21
¾ in. to 1½ in. inclusive	9	23	1	16½
1⅝ in. & larger	7½	22	1	16½

Nuts, Hot Pressed—Hexagon

½ in. & smaller	26	37	22	34
9/16 in. & ⅝ in.	16½	29½	6½	21
¾ in. to 1½ in. inclusive	12	25	2	17½
1⅝ in. & larger	8½	23	2	17½

Nuts, Cold Punched—Hexagon

½ in. & smaller	26	37	22	34
9/16 in. & ⅝ in.	23	35	17½	30½
¾ in. to 1½ in. inclusive	19½	31½	12	25
1⅝ in. & larger	12	25	6½	21

Nuts, Semi-Finished—Hexagon

	Reg.	Hvy.
½ in. & smaller	35	45	28½	39½
9/16 in. & ⅝ in.	29½	40½	22	34
¾ in. to 1½ in. inclusive	24	36	15	28½
1⅝ in. & larger	13	26	8½	23
	Light			
7/16 in. & Smaller	35	45		
½ in. thru ⅝ in.	28½	39½		
¾ in. to 1½ in. inclusive	26	37		

Stove Bolts

Pct Off List

Packaged, steel, plain finished	48—10
Packaged, plated finish	31—10
Bulk, plain finish**	62*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets

Base per 100 lb.

½ in. & larger	$7.85
Pct Off List	
7/16 in. & smaller	36

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa.

Cap and Set Screws

(In bulk) *Pct Off List*

Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright	54
⅝ in. thru 1 in. up to & including 6 in.	48
¼ in. thru ⅝ in. x 6 in. & shorter high C double heat treat	46
⅝ in. thru 1 in. up to & including 6 in.	41
Milled studs	35
Flat head cap screws, listed sizes	16
Fillister head cap, listed sizes	34
Set screws, sq head, cup point, 1 in. diam and smaller x 6 in. & shorter	53

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	21.60
Ton lots	23.75
Less ton lots	25.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

ELECTRODES

Cents per lb., f.o.b., plant threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb.
	GRAPHITE	
17, 18, 20	60, 72	17.85
8 to 16	48, 60, 72	17.85
7	48, 60	19.57
6	48, 60	20.95
4, 5	40	21.50
3	40	22.61
2½	24, 30	23.15
2	24, 30	25.36
	CARBON	
40	100, 110	8.03
35	65, 110	8.03
30	65, 84, 110	8.03
24	72 to 104	8.03
20	84, 90	8.03
17	60, 72	8.03
14	60, 72	8.57
10, 12	60	8.84
8	60	9.10

CLAD STEEL

Base prices, cents per pound, f.o.b., mill

Stainless-carbon	Plate	Sheet
No. 304, 20 pct.		
Coatesville, Pa. (21)	*29.5	
Washgtn, Pa. (39)	*29.5	
Claymont, Del. (29)	*28.00	
Conshohocken, Pa. (26)		*27.50
New Castle, Ind. (55)	*26.50	*25.50
Nickel-carbon		
10 pct Coatesville (21)	32.5	
Inconel-carbon		
10 pct Coatesville (21)	40.5	
Monel-carbon		
10 pct Coatesville (21)	33.5	
No. 302 Stainless-copper stainless, Carnegie, Pa. (60)		77.00
Aluminized steel sheets, hot dip, Butler, Pa. (7)		7.75

*Includes annealing and pickling, or sandblasting.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.505
18	4	1	—	5	$2.13
18	4	2	—	—	$1.65
1.5	4	1.5	8	—	$81.0
6	4	2	6	—	96.5¢

High-carbon chromium	62.5¢
Oil hardened manganese	35¢
Special carbon	32.5¢
Extra carbon	27¢
Regular carbon	23¢

Warehouse prices on and east of Mississippi are 3.5¢ per lb higher. West of Mississippi, 5.5¢ higher.

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags	7.4¢ to 9.0¢
Canadian sponge iron, del'd, In East	10.00¢
Domestic sponge iron, 98+% Fe, carload lots	15.5¢ to 17.0¢
Electrolytic iron, annealed, 99.5+% Fe	42.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe	53.5¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe	83.0¢ to $1.48
Aluminum	31.5¢
Brass, 10 ton lots	30.00¢ to 33.25¢
Copper, electrolytic	10.75¢ plus metal value
Copper, reduced	10.00¢ plus metal value
Cadmium, 100-199 lb.	95¢ plus metal value
Chromium, electrolytic, 99% min., and quantity, del'd.	$3.50
Lead	7.5¢ to 12.0¢ plus metal value
Manganese	57.0¢
Molybdenum, 99%	$2.75
Nickel, unannealed	88.0¢
Nickel, annealed	95.0¢
Nickel, spherical, unannealed	92.0¢
Silicon	38.5¢
Solder powder	7.0¢ to 9.0¢ plus met value
Stainless steel, 302	$3.00¢
Stainless steel, 316	$1.10
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	$6.00
Zinc, 10 ton lots	23.0¢ to 30.5¢

ELECTRICAL SHEETS

22 Ga. H-R cut lengths

F.o.b. Mill Cents Per Lb.	Armature	Elec.	Motor	Dynamo	Transf. 72	Transf. 58	Transf. 52
Beech-Bottom-15	....	7.25	8.50	9.30	9.85	10.40	11.0
Brackenridge-28	....	7.25	8.50	9.30	9.85	....	....
Follansbee-63	6.75	7.25	8.50	9.30	9.85	10.40	11.0
Granite City-22	....	7.95	9.20	....	....	....	....
Ind. Harbor-3	6.75	7.25	....	....	....	....	....
Mansfield-75	7.25	7.75	9.00	9.80	....	....	....
Niles, O.-64	7.06	7.56	....	....	....	....	....
Vandergrift-1	6.75	7.25	8.50	9.30	9.85	10.40	11.0
Warren, O-4	6.75	7.25	8.50	9.30	9.85	10.40	11.0
Zanesville-7	6.75	7.25	8.50	9.30	9.85	10.40	11.0

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads delivered. (65-72% Cr, 2% max. Si.)

0.06% C	30.50	0.20% C	31.5
0.10% C	30.00	0.50% C	31.2
0.15% C	29.75	1.00% C	31.0
2.00% C			31.7
65-69% Cr, 4-9% C			32.0
62-66% Cr, 4-6% C, 6-9% Si			32.0

Foundry Ferrochrome

Contract prices, cents per lb of alloy. Noncontract prices add 3.50¢ per lb.

High carbon 8 mesh and down.

62 to 66% Cr, 5 to 7% C, 7 to 10% Si.

Carloads, bulk	32.5
Carloads, packed	34.1
Ton lots, packed	37.2

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.5% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 1¢ for each additional 0.25% N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.

0.10% max. C.	$1.1
0.50% max. C.	1.1
9 to 11% C.	1.0

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 21.75¢ per lb of contained Cr plus 12.40¢ per lb of contained Si.

Bulk 1-in. x down, 21.90¢ per lb contained Cr plus 12.60¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, duty delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	21.0
Ton lots	22.1
Less ton lots	23.0

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	21.0
Ton lots	22.1
Less ton lots	23.2

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	16.5
Less ton lots	17.7

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.0
Ton lots to carload packed	19.0
Less ton lots	20.0

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.0
Less ton lots	19.0

Ferroalloy Prices

romanganese

6-82% Mn. maximum contract base
e, gross ton, lump size.
h. Niagara Falls, Alloy, W. Va., ... $185
shtabula, O. $187
h. Johnstown, Pa. $185
h. Sheridan, Pa. $188
h. Etna, Clairton, Pa. $188
2.00 for each 1% above 82% Mn,
enalty, $2.15 for each 1% below 78%.
Briquets—Cents per pound of briquet,
livered, 66% contained Mn.
rload, bulk 10.95
n lots 12.55

egeleisen

Contract prices gross ton, lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
lmerton, Pa.	$74.00	$75.00
. or Chicago	75.00	76.00

nganese Metal

Contract basis, 2 in. x down, cents per
und of metal, delivered.
6% min. Mn, 0.2% max. C, 1% max.
2.5% max. Fe.
rload, packed 34.75
n lots 36.25

ctrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed
st of Mississippi, cents per pound.
rloads 28
n lots 30
ss ton lots 32

dium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract
ee. carloads, lump, bulk, delivered, per
of contained Mn. ..... 19.15¢

icium Metal

Eastern zone contract prices, cents per
und of metal, delivered.

	Cast	Turnings	Distilled
n lots	$2.05	$2.95	$3.75
ss ton lots ..	2.40	3.30	4.55

icomanganese

Contract basis, lump size, cents per
und of metal, delivered, 65-68% Mn,
-20% Si, 1.5% max. C. For 2% max. C,
duct 0.2¢.
rload bulk 9.90
n lots 11.55
iquet, contract basis carlots, bulk
delivered, per lb of briquet 11.15
n lots 12.75

very Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk,
wa, or Wenatchee, Wash., $92.50 gross
, freight allowed to normal trade area.
15.01 to 15.50 pct, f.o.b. Niagara Falls,
Y., $90.00. Add $1.00 per ton for each
ditional 0.50% Si up to and including
%. Add $1.00 for each 0.50% Mn over
%.

icon Metal

Contract price, cents per pound con-
ined Si, lump size, delivered, for ton lots
acked.
% Si, 2% Fe 21.70
% Si, 1% Fe 22.10

icon Briquets

Contract price, cents per pound of
iquet bulk, delivered, 40% Si, 2 lb Si
iquets.
rload, bulk 6.95
n lots 8.55

ctric Ferrosilicon

Contract price, cents per pound con-
ined Si, lump, bulk, carloads, delivered.

% Si.....	20.00	75% Si.....	14.30
% Si.....	12.40	85% Si.....	15.55
90-95% Si			17.50

w-Carbon Ferromanganese

Contract price, cents per pound Mn con-
ined, lump size, del'd. Mn 85-90%.

	Carloads	Ton	Less
7% max. C, 0.06% P, 90% Mn	26.25	28.10	29.30
7% max. C.....	25.75	27.60	28.80
5% max. C.....	25.25	27.10	28.30
0% max. C.....	24.75	26.60	27.80
50% max. C.....	24.25	26.10	27.30
75% max. C, 7.00% max. Si.....	21.25	22.10	24.30

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge. N. Y.
Carload ..... 9.90¢
Ton lots ..... 11.30¢

Calcium molybdate, 45-40%, f.o.b. Langeloth, Pa., per pound contained Mo. $1.15

Ferrocolumbium, 50-60%, 2 in. x D, contract basis, delivered, per pound contained Cb.
Ton lots $4.90
Less ton lots 4.95

Ferro - Tantalum - columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta $3.75

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo. $1.32

Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton $65.00
10 tons to less carload 75.00

Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25%, low carbon, 0.10% C max. f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots 1.55

Ferrotitanium, 15 to 18%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $177.00

Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered $5.00

Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.
Openhearth ..... $3.00-$3.10
Crucible 3.10- 3.20
High speed steel (Primos) 3.20- 3.25

Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa. $1.14
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.13

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound
Carload, bulk lump ..... 14.50¢
Ton lots, bulk lump ..... 15.75¢
Less ton lots, lump ..... 16.25¢

Vanadium pentoxide, 86-89% V_2O_5 contract basis, per pound contained V_2O_5 ..... $1.28

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
Ton lots ..... 21.00¢

Zirconium, 12-15% contract basis, lump, delivered, per lb of alloy.
Carload, bulk ..... 7.00¢

Boron Agents

Contract prices per lb of alloy, del.

Borosil, f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B $5.25

Bortam, f.o.b. Niagara Falls
Ton lots, per pound ..... 45¢
Less ton lots, per pound ..... 50¢

Carbortam, Ti, 15-21% B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.
Ton lots, per pound ..... 10.00¢

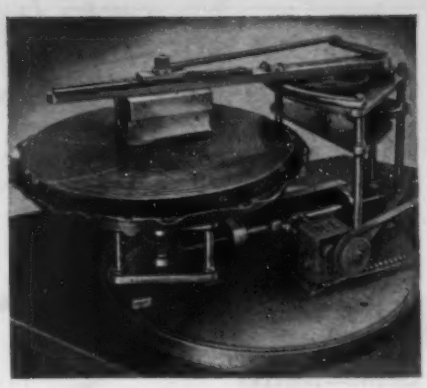
Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots $1.20
F.o.b. Wash., Pa.; 100 lb up
10 to 14% B ..... .85
14 to 19% B 1.20
19% min. B 1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.
No. 1 ..... $1.00
No. 6 ..... 68¢
No. 79 ..... 50¢

Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd
Ton lots $1.46
Less ton lots 1.57

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.
Less ton lots $1.80

Silcaz, contract basis, delivered.
Ton lots ..... 45.00¢



Especially Constructed

and built in our own plant this machine automatically Laps Gauging Ways to an absolute straight edge.

Perfect uniform wear on the lapping plate is insured because of the special construction of this mechanism. With the help of Kinematics any point on the disc will not be in the same place in relationship to the ways until the machine has made 9,999 revolutions.

Because of the attention paid to every manufacturing detail, specify Universal Balls whenever you need precision balls of fine tolerance, perfect surface finish, sphericity and size accuracy. They reduce friction, wear and maintenance costs to an absolute minimum. All Universal Balls are 100% inspected and individually gauged.

UNIVERSAL BALL CO.

PRECISION BALLS OF CHROME AND STAINLESS STEEL, BRONZE AND SPECIAL METALS.

WILLOW GROVE, Montgomery County, Pa.
Telephone, Willow Grove 1200

CONSIDER GOOD USED EQUIPMENT FIRST

AIR COMPRESSORS
2873 cu. ft. Worthington 29" x 21" & 18½ x 21". Complete with Elec. Equipment

1480 cu. ft. Worthington 23" x 14" x 16". With 300 H.P. Syn. Motor 4160/3/60

CRANE—ROUSTABOUT
Hughes Keenan Roustabout Crane Model MC-4 25' Gooseneck Boom, Mounted on Tractor. Equipped with pneumatic tires

CRANE—LOCOMOTIVE
Industrial Brownhoist Type B Steam Locomotive Crane, 50' Boom. New Boiler Installed 1946

CRANE—TROLLEY
40 Ton Shaw-Box Trolley, Equipped with 15 H.P. G.E. Motor. Gauge of Trolley 7'6". Lift 80'. New 1942

FLANGING MACHINE
¾" McCabe Pneumatic Flanging Machine, Pneumatic Holddowns, Circle Flanging Attachment and numerous dies.

No. 3 Blue Valley Flanging Machine. Will flange flat heads from 48" to 10' or 12' dia. Silent chain drive with A.C. Motor. Equipped with air cylinder and hydraulic pump

FORGING MACHINE
2" AJAX Upsetting and Forging Machine

FURNACE—MELTING
400 lb. Moore Type "UT" Melting Furnace Top Charge. Complete with Transformer. New 1943—Little used.

15 ton Heroult Model V-12 Electric Melting Furnace, Top Charge hydraulically operated. Complete with Transformer Equipment

GRINDER
No. 72 Hanchett Vertical Surface Grinder Three Spindle 72" Rotary Table with Electrical Equipment

LATHE—TURRET
Gisholt Model 2L Turret Lathe, Motor Driven 15" Dia. 3 Jaw Universal Chuck, 4" Hole in Spindle. NEW 1942 or Later.

MOTOR
750 H.P. G.E. Synchronous Motor 2300/3/60 450 RPM. Slightly Used

PLANERS
48" x 48" x 12' Niles-Bement-Pond, Four Head
60" x 60" x 12' Niles-Bement-Pond Four Head
120" x 72" x 19' Betts, Four Head

PRESS—HYDRAULIC FORGING
1000 Ton United Steam Hydraulic Forging Press Quick Acting Stroke (Daylight) 4', Distance Between Columns FtoB 31", RtoL 72" Intensifier and Accumulator included, also 8000 lb. Alliance Straight Line Manipulator. NEW 1942

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18" x 24" Waterbury Farrel Two Stand Two High Rolling Mill, Complete with Elec. Equip.

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The Clearing House

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

Subcontractor Inquiries—That small business is getting more deeply into defense subcontracting work is demonstrated by increases in the number of inquiries for machine tools in the Cleveland area. Demand still harps on late model stuff but there are a few indications that buyers are either settling for slightly older models or beginning to accept the fact that the late models have already been grabbed for tooling up and early defense production stages.

Some elements of the new inquiries are price conscious and are settling for less when the prices of excellent rebuilt machinery are quoted.

Pay Cash—Used machine tool dealers in Cleveland sometimes wonder how smaller subcontractors can put cash on the barrelhead so readily. Although there are some who must resort to financing arrangements, many smaller plants are buying with the help of private loans or with an assist from the prime contractor.

Very few RFC loans are circulating, it is reported. In some instances prime contractors are buying an interest into subcontractor firms. This assures the smaller fellow necessary cash and the prime a future source of parts and products.

Electrical Parts—Cleveland area rebuilders still report difficulty in securing electrical components although the situation has eased during the past several weeks. More rebuilders are trying to enter the field of subcontracting for new machine tool makers.

In a great many cases rebuilders here can make a variety of machine tool parts and sometimes the complete assembly. Meanwhile new machine tool makers show willingness to let subcontract work but must exercise some care in placing jobs. Rebuilders are in a good position to qualify.

Want More Work—Some rebuilders fear that business may be due for a tapering off. Others who study Air Force potential are reassured. But all realize that in order to hold their skilled help they must keep busy.

Those rebuilders who began to expand some months ago in order to build new tools or parts under subcontracting arrangements are still facing a labor shortage. They have not lost too many good hands to defense industry but they have not had any startling success in enlarging their working force to match their new size.

Incentive to Buy—Scattered reports do not show any radical changes in the used machine tool market taking place because of the new pricing order. Many dealers believe that price stability of the market should provide incentive for small business buyers to fill their needs. It should also free machines stored by some dealers.

Most dealers feel that the OPS order will have a beneficial effect on selling but this will come about gradually. Next year, they feel, should witness a return to peppy market conditions.

Dealers also hope that the need to enter defense production will induce smaller firms to buy older machines. The late models have disappeared and warehouses now have a store of good but more elderly machines that nevertheless can do the job.

Won't Budge—The Air Force considers itself lucky that some aircraft production installations of World War II remained intact—down to the tooling. The service has been able to switch a few of the stand-by machine tools to other areas but in many cases size of the tools has prevented shipment.

The Air Force expects by the end of this month to have emptied reserve tool depots at Omaha and Marietta, Ga.

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